Wallops Flight Facility
Work Center Safety Guide

Managing Safety in your Workplace

OUR AIM:
NO ACCIDENT TODAY!

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SECTION 1 PURPOSE/OBJECTIVE

1.0 Introduction

During the June 2004 Administrator's Update NASA Administrator Sean O'Keefe announced NASA's Values, which are Safety, The NASA Family, Excellence, and Integrity. A lot of soul searching went into defining these values following the Columbia tragedy. It is natural after any tragedy to think about what is really important, what we value, and many of those things that had our attention before may slide down the scale of importance. The values, it seems, had been there all along, but had been obscured by the "routine" events of daily work life and the pressures to get on to the next milestone.
While the loss of seven members of the NASA family in the manned space flight program may have seemed remote to some at Wallops Flight Facility, many might remember when five lives were nearly lost in a routine test of a Lear jet on our own runway. That mishap did not have the same impact as the Columbia mishap of course, but it was never-the-less a wake up call to reflect on our values and our way of doing business at WFF. We need to value safety and we need to be committed, individually and as a team, to protecting the safety and health of the public, our partners, our people and those assets that the Nation entrusts to us. Safety is the cornerstone upon which we build mission success and ensure the future of Wallops Flight Facility.

The purpose of this document is to give each supervisor and group lead at WFF the tools needed to fulfill our obligation to provide a safe and healthful place to work. The **four core elements** of a successful safety program are **Management Leadership and Employee Involvement,** process and procedures for **Identifying Work Place Hazards**, effective methods for the **Prevention and Control of Hazards**, and appropriate **Safety and Health Training** for all levels of the workforce.

A safe work place begins with management leading the way through motivating workers and providing the resources necessary to conduct all activities in a safe and healthful manner. Each employee must understand that safety is their responsibility and everyone's involvement is needed for success including participation on safety committees, in hazard identification and control, and maintaining a well trained workforce.

1.1 GSFC's Safety Policy

GSFC's most important core value is safety-safety of the public, astronauts and pilots, safety of our civil servant and contractor personnel and safety of our high value ground and flight equipment and property. **It is GSFC's policy to provide a safe and healthy environment for all civil servants, contractor employees and visitors.**

Safe operations in all activities are a condition of any individual's opportunity to work on and for the Goddard Space Flight Center. **No activity is so important that it cannot be performed in a safe manner.** Employees will advise management about inherently unsafe work without fear of retaliation or intimidation. Management will work with employees to ensure they have the proper training and equipment to perform work in a safe manner.

To assure safety and mission success, every project, program, or operation, regardless of size, will employ risk management processes. All projects or similar activities will implement a

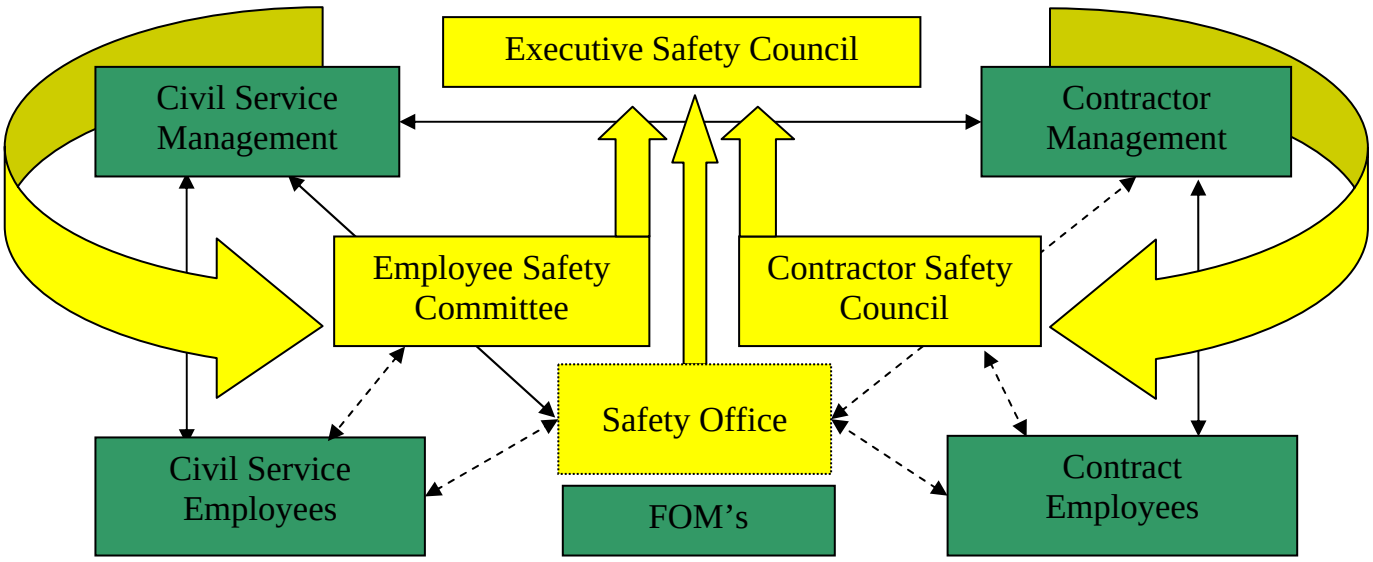
Risk Management Plan as defined by NPR 7120.5 section 4.3. The Risk Management Plan will address all potential risks to people, property, the environment and mission assurance, in addition to budget and schedule risks. Management will only accept risk when expected benefits outweigh identified risks. Projects may only proceed after approval of the Risk Management Plan.

All employees, supervisors and contractor will implement and follow the letter and intent of this policy. This policy is in accordance with NPD 8700.1, NASA Policy for Safety and Mission Success and NPD 8710.2, NASA Safety and Health Program Policy. Safety performance and adherence to this policy shall be the premier element in all employee and contractor evaluations.

1.2 Wallops Flight Facility Safety Goal and Policy

Our goal is "No Accident Today," and we must continue to develop the people and tools to provide a workplace where this will always be true. For this to happen, everyone in the Wallops workplace must understand the risks involved in the routine and the unique activities we perform and how to eliminate or control them. By learning from prior accidents and analyzing operations, we can understand how to do the job safely. By maintaining an atmosphere of vigilance, conducting inspections, reporting unsafe conditions, and following up on corrective actions, we can ensure that we have "No Accident Today."

The Wallops Flight Facility (WFF) safety structure is designed to support our goal. The **Executive Safety Council,** chaired by Dr. Campbell and supported by WFF civil servant and contractor senior managers, meets monthly to address safety and health matters at the senior management level and directs resources as necessary to maintain a safe and healthful workplace. Minutes of the meetings are posted in the Code 800 Public folder on Orion network. The Executive Safety Council works in concert with the Employee Safety Committee and the Contractor Safety Council to ensure that all safety concerns are given consideration.



The **Employee Safety Committee** represents all civil servants, and WEMA and Visitor Center employees. The Committee meets monthly to monitor employee safety and health issues, analyze safety data, foster safety awareness, and report improvements or needs to the Executive Safety Council. Minutes of the Committee are posted on the Wallops Safety Office Web Site.

The **Contractor Safety Council** members are the safety points of contact for all Wallops contract employees. They meet monthly to discuss safety and health matters of mutual interest and exchange ideas for improving the contractor safety programs. Progress, concerns, and issues are reported to the Executive Safety Council. Minutes of the Council are posted on the Wallops Safety Office Web Site.

The **WFF Safety Office** helps to identify hazards associated with WFF projects and produces safety plans to eliminate or control those hazards. The Safety Office conducts an annual assessment of WFF workplaces to identify safety and health deficiencies and areas for improvement. The Fire Department conducts fire-safety inspections of our buildings, and the Safety Office encourages and supports workplace inspections by supervisors and FOM's. Finally, the Safety Office provides training in safety and health, and works with supervisors to assist them in fulfilling their safety obligations.
We expect you to work safely and to report unsafe conditions and actions to your supervisor, and to assist in the correction of those situations. If you are a supervisor or FOM, we expect you to initiate action to correct safety problems. The Safety Office, your Employee Safety Committee representative, and the members of the Contractor Safety Council and Executive Safety Council are ready and willing to assist with any safety issue that can not be resolved at the work center-level.

To measure how well Wallops is meeting its safety objectives, we use criteria of the Department of Labor's Voluntary Protection Program. Progress in meeting objectives will be periodically assessed, and the results reported to you through training, employee safety representatives, and/or through staff or all-hands meetings.

There is no mission assigned to Wallops that is so important that we can risk harming our people or the public. In the spirit of the Goddard Space Flight Center's Safety Policy (Enclosure 1), our commitment to you is to create a safe and healthful working environment. There must be "**No Accident Today!**"

1.3 RIGHTS AND RESPONSIBILITIES

The Occupational Safety and Health Act (29 CFR Part 1960) contains provisions to assure safe and healthful working conditions for federal employees. Under the law it is the responsibility of the head of each Federal agency to establish and maintain an effective and comprehensive safety and health program which is consistent with the standards promulgated under the Act. To meet these requirements NASA has established **NPR 8715.1 Safety and Health Handbook, Occupational Safety and Health Programs.** The following selection of rights and responsibilities of supervisors and employees is derived from NPR 8715.1.

1.3.1 Supervisor Responsibilities

Supervisors are responsible for ensuring a safe and healthful workplace. This responsibility extends to any place where their employee(s) is engaged in work related to his/her job including international and extraterrestrial locations. Responsibilities include:

- Furnishing a safe and healthful place of employment and ensuring that identified hazards are eliminated or controlled through a rigorous proactive inspection and abatement process. Assuring that a safe and healthful workplace is maintained through active coordination with and support to the designated FOM.

- Ensuring that employees are informed of NASA safety and health programs and of the protection afforded employees through these programs.

- Informing employees of the location of the nearest medical treatment facility, procedures for obtaining treatment, and methods for reporting occupational injuries or illnesses.

- Instructing employees to report hazardous conditions to their immediate supervisor or to their Center or Component Facility safety and health official.

- Taking appropriate action to protect employees in imminent danger situations.

- Informing employees of specific hazards associated with their workplace and duties and ensuring use of appropriate personal protective equipment.

- Ensuring that NASA employees are provided safety and health training as applicable to the work environment (see paragraph 2.5.2.6). Ensuring that employees are informed of their specific responsibilities and rights under the Act, Executive Order l2l96, and 29 CFR Part 1960, and how they may participate in the safety and health program.

- Cooperating with and assisting safety and health personnel while they are performing their duties as specified in the NASA Occupational Safety and Health (OSH) program.

- Ensuring timely reporting of mishaps and close calls and timely follow up of any corrective actions.

1.3.2 Employee Responsibilities

Employees are responsible for the following:

- Complying with safety and health standards, rules and regulations issued by NASA, Federal, State, and local authorities.

- Using established procedures to report suspected safety or health hazards.

- Promptly obtaining necessary emergency medical care as the result of an occupational injury or illness.

- Promptly reporting occupational injuries, illnesses, mishaps, and close calls in accordance with established procedures.

- Cooperating with safety and health personnel during inspections, surveys, and investigations.

- Utilizing protective equipment when prescribed and/or required by safety or health standards, good work practices, or when directed by supervisors.

1.3.3 Employee Access to Information and Participation in the Safety and Health Program

Employees or their designated representatives shall be given the following information with regard to NASA occupational safety and health programs:

- Access to documents describing NASA`s occupational safety and health programs including the Act, applicable Executive orders, Federal, State, and local regulations, and standards.

- Access to the log and summary of occupational injuries and illnesses, including OSHA Form 300 or its equivalent, subject to the Privacy Act of 1974, as amended, 5 U.SC. 552a.

- Access to proposed NASA occupational safety and health standards and encouraged to provide comments to their appropriate representatives or committees.

- Access to inspection reports, job hazard analyses of the work site, associated job safety and health documentation, and accident investigations.

1.3.4 Employees shall be furnished the following:

NASA-sponsored medical examinations at no cost when the Center or Component Facility occupational health or safety representative identifies significant exposure or significant potential for exposure to a chemical, physical, or biological agent in the work environment.

Safety and health training, appropriate for the degree of hazard associated with their occupation or workplace.

Employees shall be represented on Center or Component Facility safety and health committees or their subcommittees.

Employees are empowered to cease any process or operation they believe is unsafe and request analysis by a qualified individual. The qualified individual will determine the corrective actions needed (if any) and when the process or operation may be resumed.

Employees have the right to report unsafe and unhealthful working conditions to appropriate officials.

Employees shall be authorized official time to participate in the Agency safety and health programs and in the activities provided for in Section 19 of the Act, Executive Order 12196, and 29 CFR 1960.

1.3.5 Dissemination of Program Information

Employees must be made aware of the Center or Component Facility safety and health programs. Copies of Executive Order 12196, 29 CFR Part 1960, details of NASA`s OSH programs, and applicable safety and health standards shall be made available, upon request, to employees or employee representatives for review.

A copy of the Center or Component Facility written safety and health program information shall be made available to each supervisor, safety and health committee member, and employee representatives.

The Center or Component Facility safety and health official(s) shall assure that a poster (NASA Form 1613, "NASA Occupational Safety and Health Protection For Federal Employees") is conspicuously posted in each major facility informing employees of the provisions of the Act, Executive Order 12196, and NASA`s OSH programs. Individual NASA Centers or Component Facilities shall augment such posters with site specific information, which includes the following:

- Details of the Center or Component Facility procedure for responding to employee reports of potential unsafe or unhealthful conditions.

- Details of NASA`s procedure for filing allegations of discrimination or reprisal for participating in the safety or health program or for reporting potential unsafe or unhealthful conditions.

- Locations where employees may obtain information regarding the Center or Component Facility safety and health programs.

- Relevant information about the Centers safety and health committee.

- An annual summary of occupational injuries and illnesses shall be posted no later than 45 calendar days after the close of the fiscal year or otherwise disseminated in written form to all employees of the workplace.

1.3.6 Freedom From Reprisal

No employee shall be subject to restraint, interference, coercion, discrimination, or reprisal for filing a report of an unsafe or unhealthful working condition, participation in the activities of the Agency’s occupational safety and health programs, or the exercise of any right or privilege afforded by Section 19 of the Act, Executive Order 12196, or 29 CFR Part 1960

1.4 Evaluating your Safety Program

The Performance Evaluation Profile (PEP) Survey is a self-assessment application used by NASA and Contractor Organizations to evaluate the effectiveness of their occupational and/or system safety programs from the management and employee perspective.

Included in your Work Center Safety Guide are PEP Survey Questions (located at the end of each section) associated with key ideas covered in the previous section. Regularly reviewing PEP Questions with your employees can allow you to evaluate “perceived or actual” strengths and weaknesses in your safety program; this can be a helpful tool for monitoring continuous improvement.

Manager Questions are followed by the employee questions for that section, or sections.

Used effectively, the PEP Survey Questions can help you go beyond the paper programs and address the culture of your organization, identify attitudes, and help you shape employee decisions to perform tasks safely.

1.5 PEP Survey Questions

Survey questions are answered using the following Scale:
(Disagree) 1 2 3 4 5 (Agree) N/A Don’t Know
Work Centers should strive to achieve 4’s and 5’s on all questions

EMPLOYEE QUESTIONS

1. My annual performance plan contains my requirements for helping achieve my organization's safety and health program goals.

2. Safety committees comprised of representatives from management, contractors, unions, and employees have been established and are active in the organization.

3. Senior management involves the safety committee in reviews of the effectiveness or the safety and health program.

4. I am familiar with the policies, goals, and objectives stated in the agency safety program's Core Process Requirements CPR.

5. A strong management commitment to safety exists in my organization.

6. Management has encouraged open communication about safety and health throughout the workforce.

7. I am aware of my rights to contact OSHA with safety and health concerns without fear of reprisal.

8. Supervisory responsibility for safety and health in my work area is clearly defined.

9. My management recognizes and supports my defined safety responsibilities.

10. My job safety accountability has been clearly defined and is, at least, equal with my other job responsibilities.

11. Management recognizes and supports the safety department's requirements for my work area.

12. My safety and health needs are being met in my work area

MANAGER/SUPERVISOR QUESTIONS

1. Management sets and communicates safety and health policy and goals. Management follows all safety and health rules, and gives visible support to the safety and health efforts of others. Managers and supervisors are informed and trained in accordance with site policy. Managers and supervisors are evaluated in performance reviews of the attention they have given to health and safety issues.

2. Management has communicated a clearly stated safety policy as reflected in the agency safety program Core Process Requirements (CPR). Each manager has made a personal commitment to provide a hazard-free workplace. Incentive programs that encourage reporting of mishap. Symptoms, injuries, or hazards, are generally promoted, management has established a safety and health committee that Includes representatives from line management, contractors, union and employee representatives.

3. Management has assigned and communicated clearly defined responsibility for safety and health in position descriptions and performance plans, Site safety and heath issues are regularly included on the agenda of the directorate committee meetings such as civil service and contractor mishaps. Open and completed discrepancies are reviewed. Safety committees meet on a regular basis and minutes of the meetings are kept and distributed to all attendees, similar committees have been established in all of the divisions and branch levels. The results of these meetings are reported to the Director, and the Director performs an annual evaluation of the Directorate's effectiveness in implementing their safety and health plan including accomplishment of its goals and objectives. Budgets are adequate to achieve goals and objectives.

SECTION 2 WORK CENTER INFORMATION

2.0 Introduction

To create a culture where safety is a core value the elements of the WFF safety program need to be translated into offices, shops, and labs where the work is being performed. This section describes the work center, its activities and people, their safety plan and how it is implemented. The following outline is provided to act as a framework for the work center information and examples are provided which should be replaced by information specific to your work center.

2.1 About Us

- **2.1.1 Functional Statement** (What the Work Center does)
- **2.1.2 Organization Chart** (How the organization works together)
- **2.1.3 Staffing Chart** (Include Work Center personnel, supporting staff, and contractors)
- **2.1.4 Work Center FOM and Employee Safety Committee Representative** (Include the committee members name and how the Work Center will interact with the representative such as committee member will provide a brief report at monthly staff meetings)

2.2 Work Center Safety Plan

2.3 Work Center Safety Goals & Objectives

2.4 Work Center Safety Awards

2.5 Reporting Schedule

2.6 Work Center Score Card

2.7 PEP Survey Questions

EXAMPLE OF WORK CENTER INFORMATION SECTION

2.1 About Us

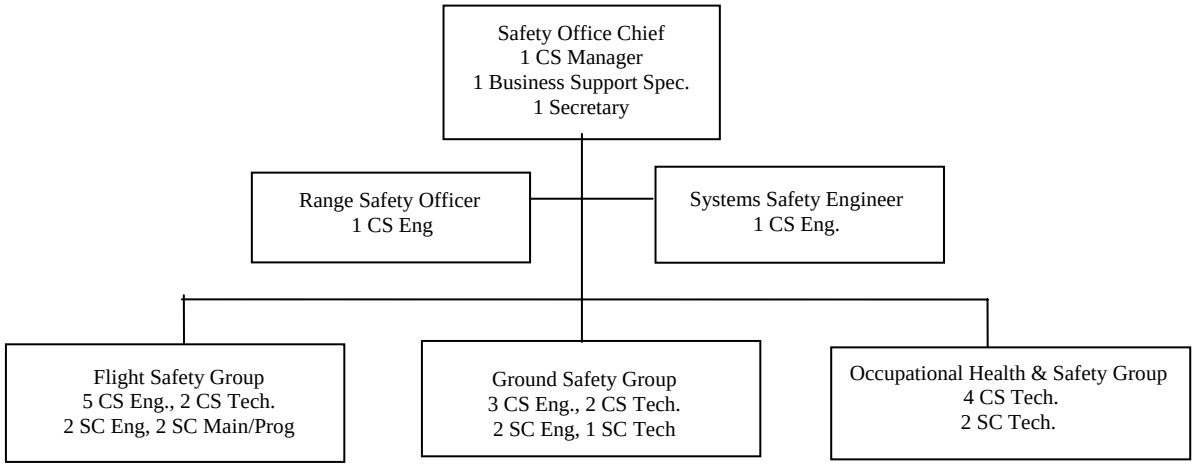
2.1.1 Functional Statement for Code 803 *[Example]*

The WFF Safety Office (Code 803) plans, develops, and provides functional management of policies, procedures, and technical requirements for ground and flight safety and mission assurance for all WFF offices and missions. In addition, systems safety and engineering analysis of ground and flight safety systems, environmental conditions, and operational activities are performed to identify risk and assure safety, reliability, and flight worthiness. Establishes and approves safety precautions for protection of personnel, property, and the public from hazards generated by ground and flight systems. These services are provided for all WFF managed projects, both locally and at remote locations. The Safety Office implements the WFF occupational safety and health program including non-ionizing radiation protection,

explosive safety, fire protection, and emergency preparedness. The Safety Office supports the Executive Safety Council, the Employee Safety Committee and the Contractor Safety Council and provides management of the facility fire department. The Safety Office provides safety management of payloads for small payload carrier systems.

2.1.2 Organizational Chart *[Example]*

Code 803 Safety Office



The Office of the Chief establishes and maintains safety and mission assurance policies and technical requirements and develops and maintains fiscal and manpower budgets in support of projects for the facility's missions and operations.

The Range Safety Officer (RSO) serves in the capacity of Chief Engineer for the Flight Safety, Ground Operations Safety, and Ground and Flight Systems Safety disciplines. The RSO reviews and approves the technical content of safety plans and safety analysis reports. The RSO performs independent reviews of operations conducted at or managed by WFF to ensure proper identification and mitigation of hazards and to assess the safety of operations across discipline boundaries. The RSO holds the responsibility for certifying and operating elements of the Range Safety System used to protect personnel from debris hazards associated with launch vehicle operations. The RSO identifies the technology requirements as they pertain to Safety Systems and process. The RSO provides design requirements and oversight in obtaining new systems to support the safety process. The RSO uses the Independent Safety Assessment and Range Safety Certification processes.

The Flight Safety Group (FSG) provides mission risk analyses, develops Flight Safety Plans, and implements operational flight safety. The FSG performs flight hazard analyses, mission feasibility studies, and mission risk analyses. The FSG calculates aircraft, ship, and other flight hazard areas and the flight termination limits for systems with Flight Termination Systems (FTS). The FSG performs trajectory and dispersion analyses and generates data to determine the effects of wind weight on flight vehicles. The FSG generates graphical displays to support real-time safety operations. The FSG develops and maintains computer software to aid in performing analysis. The FSG provides personnel to support operational safety such as wind weighting, surveillance, and provides Flight Safety Officers to monitor vehicle flight and make

real-time flight termination decisions. The FSG also provides Flight Safety/Range Safety Officer training to NASA, DOD, FAA and commercial customers. The Flight Safety Group uses the Risk Assessment, Range Safety Flight Operations, and Range Safety Education and Training processes.

The Ground Safety Group (GSG) performs hazard analyses on orbital and sub-orbital launch vehicles, payloads, unmanned aerial vehicles, balloons, missiles, drones, aircraft, and associated systems (pressure systems, chemical systems, lasers, etc.) which are flown as part of WFF Test Range activities or Remote Missions. The purpose of these analyses is to ensure proper design safety principles are employed and to define operational restrictions and danger areas that will protect personnel in the event of a catastrophic system failure. The GSG generates Ground Safety Plans, which document the system design and safety features and defines the operational danger areas and restrictions. The GSG reviews and approves all hazardous operations procedures and provides operational support in a safety oversight capacity. The GSG ensures the Flight Termination Systems (FTS) are designed and tested to meet range requirements thus assuring reliability and survivability in the event of a launch vehicle malfunction. The GSG is responsible for reviewing and approving system design, environmental test procedures, for performing final certification of FTS. The GSG provides operational support for missions containing an FTS to assist the Range Safety Officer in certification and operation of the system. The GSG also provides ground safety training in support of Operations Safety Supervisor certification. The Ground Safety Group uses the

The Occupational Health and Safety Group (OSHG) plans, develops, and implements facility assurance programs and controls for the safety of personnel, protection of property, and reliable operations of facilities that reflect the elements of the DOL Voluntary Protection Program (VPP). The WFF facilities consist of a wide range of fabrication shops, rocket motor storage and processing facilities, materials testing apparatus, tracking and telemetry capabilities, laboratory operations, and launch range operations. The OSHG performs periodic reviews of research facilities, apparatus designs, and operations to ensure compliance with established programs and regulations. The OSHG supports the Executive Safety Council, the Employee Safety Committee and the Contractor Safety Council. Significant efforts are spent in the coordination of the various contractors' safety programs. The OSHG provides safety and facility assurance support through the following work processes: Occupational Safety including non-ionizing radiation protection, Explosive Safety, and Emergency Preparedness programs.

The Systems Safety Engineer provides project support for those projects that are in their initial or formative stages before they are handed off to range safety analysts. The Systems Safety Engineer works in coordination with the RSO and other Groups to identify and develop new technologies to aid in the efficiency and effectiveness of safety office processes. The Systems Safety Engineer will be focal point for assurance functions needed to support new and bigger projects that Wallops Flight Facility is undertaking. The Systems Safety Engineer serves as the Jurisdiction Having Authority for fire protection and explosive safety.

2.1.3 Safety Office Staffing *[Example]*

The total Safety Office staffing is shown in the table below, as civil service and support contractor in the functional areas.

Management

Safety Office Chief – Les McGonigal
Secretary –
Business Support Specialist -

Systems Safety Engineer – Terry Potterton

Range Safety Officer – Mike Patterson

Flight Safety Group

Flight Safety Group Lead – Rob Beyma
Flight Safety Engineers – Steve Skees, Greg Smith, Todd Thornes, Linda Wiles, Ed Melson (SC), and Darryl Covington (SC)
Flight Safety Technicians – Jim Veney, Roland Wescott, Jimmy Gladding (SC), and Peter Turek (SC)

Ground Safety Group

Ground Safety Group Lead – Tom Moskios
Ground Safety Engineers – Ben Robbins, Gordon Marsh, and Jerry Morris
Ground Safety Technicians – Chico Ayers, Greg Ellis, Wayne Borrmann (SC), Don Grant (SC), and Jack Smith (SC)

Occupational Health and Safety Group

Occupational Health and Safety Group Lead – Robert Nock
Safety Specialists – Gene Furness, Howard Kilmon and Stan Williams
Industrial Hygiene Technician – Marv Bunting (SC)

Fire Department

Fire Officers 6
Fire Fighters 21

2.1.4 FOM and Employee Safety Committee Representative *[Example]*

The FOM for E 108 is Jim Veney and the FOM for E 106 is Jay Brown. The FOM for B 129 (Main Base Fire Station) is and the FOM for X 35 (Island Fire Station) is
The Employee Safety Committee representative is Stan Williams who reports at the All Hands meeting once each month.

2.2 Safety Office Safety Plan

Training

- Once each week a specific safety topic will be discussed during the Monday 803 staff meeting with Group Leads, RSO, Systems Safety Engineer, and Business Support Specialist.
- Group Leads will discuss a specific safety topic pertaining to 803 working conditions during each group meeting.
- Occupational Health & Safety Group members receive safety and occupational health training as needed according to their assigned duties.

Safety Awareness

Once each month at the 803 All Hands meeting the Employee Safety Committee representative will give a report from the last EmSC meeting and someone will present a safety topic for discussion.

Job Hazards Analyses

Once each year Group Leads will review JHAs to determine their currency and adequacy. JHAs will be added to or modified accordingly with a copy going to the Office Chief

Safety Inspections

Once each month Group Leads will perform a Safety Walk Down of their spaces accompanied by one of their group members and either the Office Chief or FOM, using checklists

Hazards that are identified will be corrected;
1. On the spot if they can be.
2. Referred to the FOM if the correction requires a work order
3. Referred to the Facilities Utilization Review Board if facility modifications are needed

If a PPE need is identified through a JHA or inspection it will be acquired through the office budget.

2.3 Safety Office Goals and Objectives in CY 06

In the coming year it is our goal to develop the occupational safety and health capability within Code 803 to support the implementation of the elements of VPP. In order to do this we are raising the level of awareness through the Safety Awareness Campaign and the creation of a revised WFF Pocket Guide.

Additional goals for CY 06 are the strengthening of the Facilities Operations Manager Program with quarterly briefings on its progress at the Executive Safety Council and the development of the safety portion of the emergency preparedness plan. The WFF Safety Office will also improve the effectiveness of the Industrial Hygiene program by completing the IH baseline survey and confined space location assessment. Our goal for CY 06 is also to acquire or develop more effective and efficient risk analysis tools to support range projects.

Performance Metrics

Metrics for the goal of developing the occupational safety and health capability will include:

- Percent compliance with VPP criteria,
- Close Call/Hazard Reports (reported vs corrected),
- Timeliness of corrective actions
- Improvements in PEP scores at WFF, and
- Job Hazards Analyses (JHAs) completed and reviewed annually.
- Safety efforts across WFF Work Centers are also measured in a monthly report via the Work Center Safety Scorecard

Metrics internal to the 803 Work Center are captured in the Work Center Scorecard

2.4 Wallops Safety Awards

It is very important that hard work be recognized and recognition for safety should be of highest priority. Awards help motivate and provide incentive for employees to maintain a safe work environment. Awards are also an outward sign of the importance that management is placing on safety in the workplace.

Time-Off Award:
Time-Off Awards are awards of time-off without charge to leave or loss of pay primarily intended to recognize employee(s) contributions of a one-time non recurring nature. Time-Off Awards can be used alone or in conjunction with monetary awards (Job Performance or Special Act). Time-Off may be granted in amounts of up to 40 hours for a single contribution not to exceed 80 hours during a calendar year. All GSFC employees are eligible. Refer to GPD 3451.1 to determine the number of hours appropriate for the contribution.

Time-Off Awards are submitted on Form GSFC 17-8. Guidelines and forms can be found at:
http://ohr.gsfc.nasa.gov/awards/home.htm

Safety Award of Distinction:
Safety Award of Distinction recognizes civil servants, contractors, and external team members whose actions in the event of an emergency demonstrate a selfless commitment to protect and preserve human life while maintaining personal safety and safety of others.

Safety Award of Distinction Nomination Forms can be found at:
http://ohr.gsfc.nasa.gov/Forms/ohr/HonorAwards.doc

Wallops Flight Facility Safety Award:

The WFF Safety Award is awarded to an individual and to a group. The awards are presented at the end of the calendar year during the Annual awards ceremony. WFF management will seek nominations for the award in November and a form for submitting nominations will be provided upon request.

Qasar Award:
QASAR stands for Quality and Safety Achievement Recognition. The QASAR Award recognizes NASA or other Government, and prime/subcontractor individuals for significant quality improvements to products or services for NASA, as well as safety initiatives within products, programs, processes, and management activities. NASA headquarters and each of the Centers have local QASAR Award programs: annually the “Best of the Best” in each award category is chosen for Agency recognition by the Administrator.

Qasar guidelines and nomination forms can be found at:
http://www.hq.nasa.gov/office/codeq/qasar/index.htm

2.5 Reporting Schedule

The following schedule is provided to assist the Work Centers in identifying when activities should be conducted and information reported.

Activity	Frequency	Date	Comments
Work Center Score Card submission to Occupational S&H Office	Monthly	The first week following the reporting month	
Work Center Score Cards Presented to Executive Safety Council	Quarterly	Jun, Apr, July, Oct. meetings	Occupational S&H Office will compile the monthly reports and will present the findings to the Council
WFF Safety Goals and Objectives	Annually	1st Quarter of each year	Post goals and objectives. Brief employees
Work Center Goal and Objectives	Annually	1st Quarter of each year	Prepare and post goals and objectives. Brief employees
Work Center Safety Plan	Reviewed and revised annually	Established by Work Center	Each Work Center should establish their own date for annually evaluating and revising their Safety Plan. This date shall be incorporated in the WC Safety Plan
Job Hazard Analyses	Once for each Job Then update annually or as required	Initially as soon as possible	See Section 3.1 Job Hazard Analysis regarding JHA updating
Work Center Inspections -FOM's inspection - General work areas - Work areas with Category 1&2 hazardous operations	 Quarterly Monthly Weekly	Established by Work Center	See Section 4.1 Hazardous Operations for category 1 – 3 explanation Document all inspections and maintain records Record and track finds to closure
Work Center Plans	Annual Review	Established by Work Center	See Section 4.2 for a list of the Plans that may impact your Work Center
Safety Awareness Training	Monthly	Established by Work Center	Document- attendance, date, and topic
Hazard Communication Training (HAZCOM)	Annually	Established by Work Center	All employees shall attend HAZCOM awareness training See Section 5.1.3 to determine if employees need site specific HAZCOM training
Employee Safety Committee Report to Work Center personnel	Monthly	Established by Work Center	
New Employee or New job assignment	Once	Prior to beginning work activities	See Section 5.1.1 for New Hire Orientation See Section 5.1.2 for New Job or Process Orientation
Employee Job Specific Training	As Required	As Required	See Section 5.1.4
Tracking Employee Training Needs	Monthly	Established by Work Center	Do not allow training to expire for more than 30 days beyond due date.
Safety & Health Program Evaluation	Annually	Date set by Safety Office with Work Center concurrence	Work Center is required to close findings w/in 30 days or prepare a hazard abatement plan identifying when closure will be achieved

2.6 Work Center Score Card

Wallops Flight Facility
Work Center Score Card

Organization _____ **Code** _____ **Date** _____

Supervisor _____ **Safety POC** _____ **Report Period** _____

	Response
Section 1. Purpose and Objectives	
WFF and Work Center Safety goals and objectives have been posted and employees briefed annually. _____ (Date)	**Yes / No**
Section 2. Work Center Information	
a. Work Center Safety Plan, Goals & Objectives established and updated annually _____ (Date)	
b. Safety Awards presented this reporting period	
c. Number of awards recommended	
Section 3. Hazard Analysis, Identification, Reporting & Correction	
a. Number of JHA's needed (tasks identified as needing JHA's)	
b. Number of JHA's completed – Percentage %	**%**
c. JHA's Reviewed or Revised Annually (minimum)	**Yes / No**
d. Work Area Inspections completed on schedule [FOM-quarterly; Work Areas-Monthly; High Hazard Areas-Weekly]	**Yes / No**
e. Were any hazards identified or close calls reported	**Yes / No**
f. Hazards corrected within RAC time limit (Ref. 3-21)	**Yes / No / NA**
Section 4. Hazard Prevention and Control	
a. All work center Hazardous Operations are identified and controls are in place	**Yes / No**
b. Work instructions/standard operating procedures are available and current	**Yes / No**
c. Appropriate Plans (Ref. 4.2) are prepared and reviewed/revised annually	**Yes / No**
d. Workers have appropriate PPE as identified in the JHA for each activity	**Yes / No**
e. Workers have been instructed on the hazards associated with their work.	**Yes / No**
Section 5. Safety and Health Training & Awareness	
a. Employee S & H training has been identified	**Yes / No**
b. A tracking mechanism is in place to ensure training is current	**Yes / No**
c. Employee training is current	**Yes / No**
d. Monthly Awareness training conducted	**Yes / No**
e. Employee Safety Committee Representative report presented to work center monthly	**Yes / No**
f. New employee safety briefings conducted	**Yes / No / NA**

2.7 PEP Survey Questions

Survey questions are answered using the following Scale:
(Disagree) 1 2 3 4 5 (Agree) N/A Don't Know
Work Centers should strive to achieve 4's and 5's on all questions

EMPLOYEE QUESTIONS

1. Specific safety and health objectives have been developed for my organization.

2. Staff safety meetings, including all levels of the workforce, are regularly held at this site.

3. Safety and health procedural documentation and directives are kept up-to-date in my work area.

MANAGER/SUPERVISOR QUESTIONS

1. Management assigns responsibility for implementing a site safety and health program to identified person(s). Management's designated representative has authority to direct abatement of hazards that can be corrected without major capital expenditure. Mishap history files are kept for a minimum of 3 years. Management keeps, or has access to, applicable standards at the facility and seeks appropriate guidance information for interpretation of applicable standards. Management representative has authority to order/purchase safety and health equipment.

2. Clear lines of authority and responsibilities are defined for both managers and employees. Managers and employees are held accountable for safety and health in the workplace. Written safety procedures, policies and interpretations are updated based on reviews of the safety and health program. Safety and health expenditures, including training costs and personnel, are identified in the facility budget. Hazard abatement is an element in management's performance evaluation.

3. Management safety and health has expertise appropriate to facility size and processes, and has access to professional advice when needed. Safety and health budgets and funding procedures are reviewed periodically for adequacy. Management enforces the rules of holding responsible persons accountable for safety and health. Safety hazards are identified and rectified expeditiously.
Contractor sets and communicates safety and health policy and goals, but remains detached from all other safety and health efforts.

4. Contractors follow all safety and health rules; and gives visible support to the safety and health efforts of others. Management and supervisors are informed/trained in accordance with the contractor's program. Managers and supervisors are evaluated in performance reviews on the attention they have given to health and safe Issues.

5. Contractor has communicated a clearly stated safety policy. Contractor has made a personal commitment to provide a hazard-free workplace through site inspections, incident reviews, and program reviews. Incentive programs that encourage reporting of mishaps, symptoms, injuries, or hazards are generally promoted when evaluating line management, all performance reviews are closely evaluated on

the manager's proactive involvement in safety and health Issues. Contractor has established a safety and health committee that includes representatives from line management as well as union and employee representatives. Contractor has budgeted both manpower and resources to support his safety and health program.

6. Contractor has assigned and communicated clearly defined responsibility for safety and health in position descriptions and performance plans. Site safety and health Issues are regularly included on the agenda of the contractor's staff meetings. Contractor's upper management routinely evaluates site safety program results in an ongoing effort to identify problem areas and implement improvements.

SECTION 3 HAZARD ANALYSIS, IDENTIFICATION, REPORTING, AND CORRECTIVE ACTIONS

3.0 Introduction

To some degree all work activities have hazards or risks associated with them. Hazards such as working with explosives or chemicals are easy to recognize. Hazards associated with other activities may not be as obvious. What appears to be a simple repetitive task may cause or contribute to debilitating musculoskeletal disorders. It is incumbent upon the supervisor and workers to analyze the actual and potential hazards associated with their work. Once actual and potential hazards are identified then control measures can be implemented to eliminate or reduce the probability of an injury or illness occurring.

After job hazards have been analyzed and control measures identified and implemented, periodic work area surveillance is performed to verify that prescribed controls are implemented and enforced. Work area inspections also serve to identify changes in the work environment that may create hazards for the work force. When hazards are identified or an injury occurs prompt reporting is required. Corrective actions need to be implemented to correct identified hazards. Hazards that create an imminent danger to employees will require immediate corrective actions. Some corrective actions may require funding before they can be implemented. When delays are encountered in the implementation of corrective actions it is necessary to create a hazard abatement plan. In all cases corrective actions should be tracked to closure.

Section 3 of this document provides the user with information and tools for analyzing, identifying, reporting and correcting hazards. The forms for this section can be used as is or modified to meet the user's specific needs.

3.1 Job Hazard Analysis

As stated in 1.4.1 of this document, NASA has assigned the supervisor as the individual responsible for ensuring a safe and healthful workplace, informing employees of specific hazards associated with their work and ensuring use of appropriate personal protective equipment. A Job Hazard Analysis (JHA) identifies job hazards and prescribes control measures. Use of these controls is intended to prevent injury. Use of JHAs in worker training improves communication about job hazards and the hazard controls the worker must use in order to prevent injury. JHA-prescribed controls can be incorporated into inspection checklists and audits to ensure implementation and enforcement. Periodic JHA reviews (usually annually or when a process changes or injury occurs) improves the JHA quality, adds new knowledge on hazard recognition and safe work practices. The JHA is a NASA requirement found in NPR 8715.3 section 3.8.

The JHA process:

- First prepare a job task inventory (A list of all the jobs performed by a work center).
- Uniquely identify each job to avoid duplication or unnecessary overlap.
- Prepare a schedule for completing each JHA based on priority (If it's not planned it may never get done).

- Select key people to develop or assist with the development of each JHA.
- Provide adequate training for the individuals so they will be able conduct or assist with the process. Your Employee Safety Committee representative is trained to conduct JHAs
- Determine who should review and approve each JHA.
- Once the JHA is drafted it should be reviewed for accuracy. This is also a good time to see if immediate process changes can be made to eliminate hazards.
- The completed JHA should be reviewed by everyone associated with the job and control measures should be implemented as soon as possible.
- Newly hired or newly assigned employees should first review all applicable JHAs that will affect their work before they beginning their duties.

The JHA is a three step process

1. Identify the steps necessary to complete a task
2. Identify the hazards or potential hazards associated with each step
3. Identify controls and safe procedures to mitigate hazards identified

Table 3.1 Example of One Step in a JHA

No.	**Job Steps**	**Potential Hazards/Causes**	**Recommended Controls**
1	General Operations Handling, Storage, and Cutting of material	Back and leg strain/permanent musculoskeletal disorders due to improper lifting	Provide workers with adequate work space to safely use authorized handling equipment for materials movement. Train workers in proper lifting techniques.

Job Steps – Use both personal observations of the job and discussions with the operators.

1. List each step of the job or task
2. Be as detailed as possible/practical
3. Use action words (stack, place, saw, etc.)
4. Watch for a change of activity, direction or movement
5. Include regular and emergency maintenance
6. List tools and equipment use by the operator
7. List chemicals – dusts, gases, mists, vapors, fumes

Potential Hazards/Causes – When looking at each step look to see if any of the following hazards are present or could they be present.

1. Toxic chemicals
2. Flammable chemicals
3. Corrosive chemicals
4. Environmental heat, cold, insects etc.
5. Explosive (chemical reation)
9. Electrical (fire)
10. Electrical (static, ESD)
11. Electrical (loss of power)
12. Ergonomics (overexertion)
13. Ergonomics (human error)
17. Excavation (collapse)
18. Fire, heat, thermal, cold
19. Noise
20. Radiation (ionizing, non-ionizing)
21. Caught (in, on, or between)

6. Explosive (overpressure)
7. Mechanical/vibration
8. Electrical (shock, short circuit
14. Vibration
15. Fall (slips/trips)
16. Fall (to a different level)
22. Weather
23. Visibility
24. Struck (by, against)

Recommended Controls – Whenever possible hazard elimination is the best option. When a hazard can not be eliminated they must be controlled to reduce the likelihood of injury to the greatest extent feasible. The first option is engineering controls, then administrative controls and the last option is personal protective equipment. Examples of some of these controls include:

Engineering
- Substitute a less hazardous material for the work
- Use mechanical methods instead of manual methods such as lifting
- Lab hoods
- Local exhaust ventilation
- Noise dampening
- Lock out/Tag out

Administrative
- Training
- Job rotation
- Written Procedures

Personal Protective Equipment
- Protection for the Head, Eyes, Ears, Face, Body, Hands, Feet, and Respiratory System

Potential resources available to assist in the JHA process

- Injury/illness reports
- Chemical or noise exposure data
- Material Safety Data Sheets (MSDS)
- Operating procedures
- Manufacturer's instructions
- OSHA regulations such as machine guarding, industrial trucks, noise
- Maintenance history
- Preventative maintenance requirements
- Production problems
- Quality issues

Managing JHAs

JHAs are living documents that should be periodically reviewed and updated. A system should be established to create, maintain and update them. The list should contain the task name, department name, and date created or last revised. JHAs should be used for new employee orientations, for identifying training needs, and control measures including personal protective equipment.

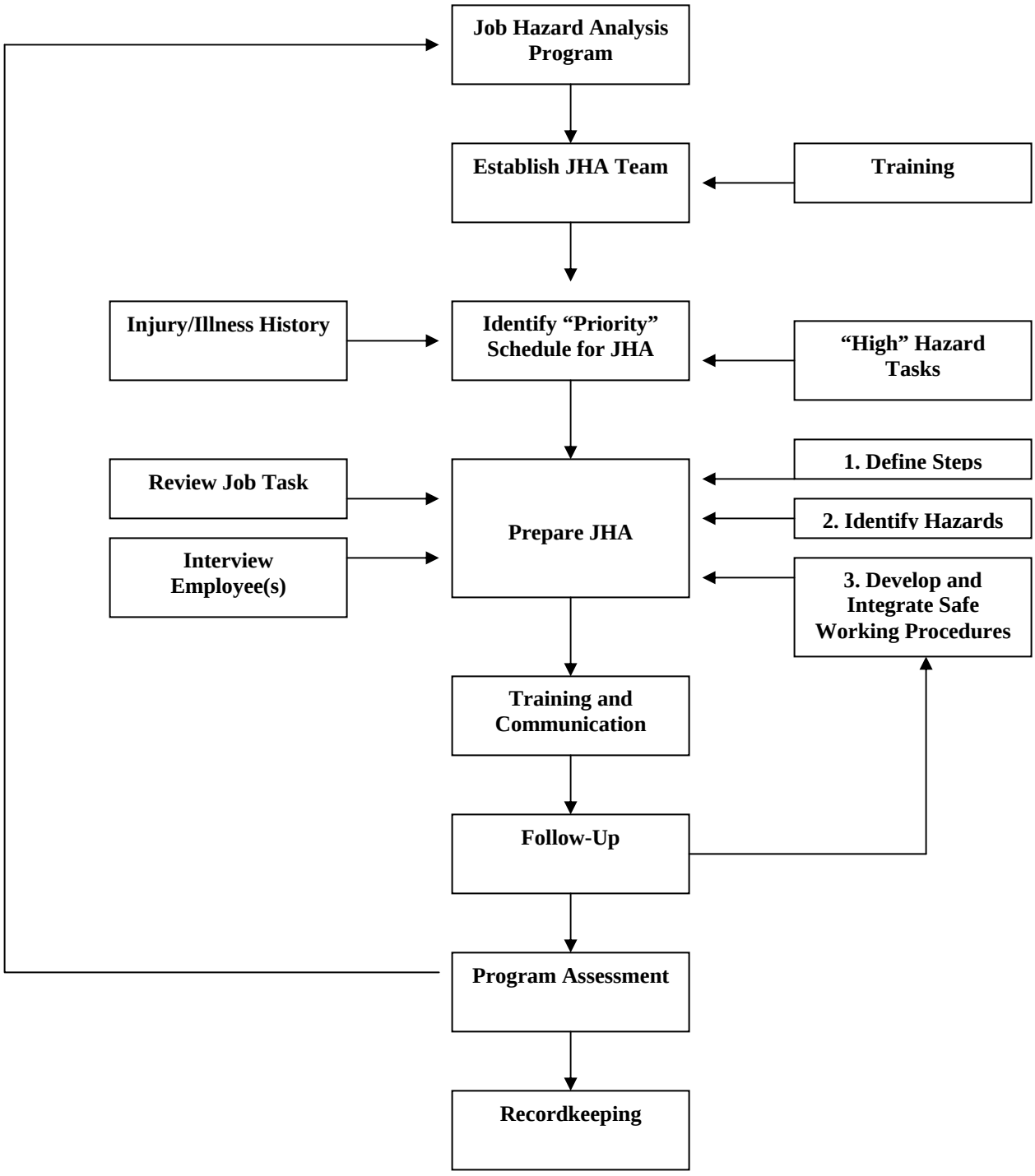
JHAs should be reviewed during all accident/incident investigations and revised if needed. JHAs should be reviewed and modified when changes to equipment, tools, materials or

location occur. At a minimum an annual review should be performed to verify completeness and to determine if any improvements can be made.

3.1.1 JHA Forms

The JHA form in this section or in Appendix D may be reproduced and filled in by hand or an electronic version created. Each JHA should have a cover sheet and analysis page(s).

Job Hazard Analysis Flow Chart



Certification of Hazard Assessment
For

_____

(operation or task)

Certified by _____

(supervisor)

LOG OF REVIEWS & REVISIONS

Review/Revision	Signature	Date

Cover Sheet for JHA

Page ____ of ____

JOB HAZARD ANALYSIS

Job/Task: **Date:**

Analyst: **Location:**

Employee(s):

No.	Job Steps	Potential Hazards	Recommended Controls

3.1.2 Work Center Processes

[Example of Code 803 Process]

Independent Assessment of Program Technical Approach and Implementation

Range Safety System Certification and Technology Development

Risk Assessment, Mitigation and Standards Compliance

Range Safety Flight Operations

Range Safety Education and Training

Occupational Safety Program

Emergency Preparedness Program

Explosive Safety Program

3.1.3 Work Center JHAs

3.2 Hazard Reporting

ALL employees should understand their responsibilities and options for reporting.

A hazard is an unsafe or unhealthful condition that could lead to a mishap if it is not corrected. A frayed electrical cord, cords across a walkway, loose stair treads, gas leaks, and chemical spills are examples of workplace hazards.

If you see a hazard or what you think is a hazard, the following actions can be taken:

a. Correct the hazard yourself if you can and tell your supervisor.

b. Report the hazard to your supervisor or higher management if you can't correct it yourself.

c. Facility related issues can be report to the HELP Desk by dialing HELP (4357) or report the hazard to your facility operations manager (FOM).

d. Report the hazard to the Safety Office (Extension 1625). Subparagraphs e through g below are methods to report hazards to the Safety Office. The person that takes your call will record your information and track your report until it is resolved. You will need to provide the following information:

- When you reported the hazard (date and time)
- Where you found the hazard
- What the hazard is
- If you want your name kept confidential

e. Call, email, or send a note to the WFF Safety Office. Your name will be kept confidential if requested.

f. Use the Close Call Reporting web page located at http://safety1st.gsfc.nasa.gov/closecall.shtml.

g. Fill out a Close Call Report, on the above web URL, and fax it to the number on the form. A hazard is a potential close call. Your name will be kept confidential unless you check the box on the form. See your site's procedures if you work at a WFF field site.

h. Call the WFF Senior Official if you get no satisfaction from the Safety Office. Your name will be kept confidential unless you give permission for your name to be released.

i. Call or e-mail the GSFC Safety Ombudsman, Judy Bruner, at 301 286-7679

j. Report it directly to NASA Headquarters through Director, Safety and Risk Management Division, or Director, NASA Occupational Health Office, if you get no satisfaction from WFF. Subparagraph k is another method to report hazards to NASA Headquarters.

k. Send in a NASA Safety Reporting System (NSRS) form. Fill out an NSRS form, usually found near bulletin boards in several buildings at WFF, and mail it in as shown on the form. Your name will be kept confidential.

l. Call the Occupational Safety and Health Administration (OSHA) Office (1-800-321-OSHA or 1-800-321-6742) if you get no satisfaction from NASA Headquarters. This number is available 7 days a week, 24 hours a day. Your name will be kept confidential.

3.3 Work Area Inspections

Work area inspections are a proactive method for identifying and eliminating hazards in the work environment before they cause injury or illness. The inspection process also reinforces adherence to established safe work procedures and control implementation. Work area inspections should be conducted monthly at a minimum (high hazard areas may need to be done more frequently) and the process documented. A proven method to increase efficiency and reduce omissions is the use of an inspection checklist. Two general checklists are provided in this guide to facilitate the process. Checklists need to be tailored to the specific work area. The JHA developed for work processes will identify control measures for potential hazards. The JHA control measures identified for a specific work area should be included on the checklist.

> For example: OSHA requires forklifts to be inspected daily before use. This would be listed as a control measure on the JHA for forklift operation. The monthly checklist should have a line item informing the inspector to check the forklift inspection log book/sheet to verify compliance with the requirement.

When potential hazards or discrepancies are identified during the inspection process they need to be documented, reported if necessary, and tracked until closed. Potential hazards associated with work practices may require modification to procedures, JHAs, training or retraining of employees, or potential disciplinary actions. Other hazards can be reported and corrected as outlined in section 3.3. Once a hazard has been identified it needs to be tracked to closure. If the hazard can not be corrected in a timely manner than an interim corrective action may need to be implemented. This will depend on the risk posed by the hazard, the likelihood of injury, and the severity (See the section discussion on Risk Assessment Codes). A hazard that will take more than 30 days to correct will require the submission of a hazard abatement plan (See section 3.11) to the Safety Office.

The following checklists can be modified and used by the work area inspector. More detailed process specific checklists are also available from the Safety Office upon request. These checklists for example cover: Welding Operations, Battery Storage Areas, Flammable Storage Area, etc. The Safety Office is available to assist the inspector during any portion of the work area inspection process.

OFFICE SAFETY CHECKLIST

Name (print) Manager/Supervisor		Org. Code
Bldg/Location	Ext.	Date

Housekeeping, Egress, Walking Surfaces	Yes	No	N/A	Date Fixed
Evacuation routes are posted conspicuously and employees have received emergency evacuation instructions.				
Evacuation plans exist to assist employees with disabilities.				
Work area, corridor & stairways are clear of clutter, obstacles & electrical debris.				
Floors are kept free of oil, water, and other slip/trip hazards.				
Material is not stored on top of cabinets where it could fall.				
Emergency lighting is provided, maintained, and periodically tested.				
Exits are unobstructed and marked with lighted 'EXIT' signs.				
Employees have received Ergonomics training.				
Electrical Safety				
Electrical outlet receptacles located within 6 feet of water fixtures are protected with ground-fault circuit interrupters (GFCI).				
Extension cords are not used in place of permanent wiring (not to exceed 6-feet in length).				
Extension cords are not frayed, spliced, cut or otherwise in poor condition.				
Ground conductors on three-prong plugs are in place.				
Live wires, fuses, and busses are not exposed.				
Electrical junction boxes and wire-ways have covers in place.				
Circuit breakers are labeled to indicate which breaker controls each circuit.				
Three feet of clear space is maintained in front of electrical panels.				
Fire Protection				
Fire extinguishers are readily available in the work area.				
Fire extinguishers are fully charged and in good condition.				
Fire extinguishers have been inspected within last 12 months. (Check date on extinguishers. If greater than 12 months old, notify Safety Office).				
Items are not stored within 18 inches of sprinkler heads.				
Fire doors are not propped open.				

All items checked "NO" need to be corrected as soon as reasonable and then dated.

Signed: Manager/Supervisor	**Date:**

SHOP SAFETY CHECKLIST

Name (print) Manager/Supervisor		Org. Code
Bldg/Location	Ext.	Date

PERSONNEL SAFETY	**Yes**	**No**	**N/A**	**Date Fixed**
Personnel are trained to recognize hazards in their work place.				
Safety rules are clearly communicated and enforced.				
Safety glasses and other eye protection are available and used.				
Hearing protection equipment is available and used.				
Employees are trained in the selection and use of Personal Protection Equipment (PPE).				
PPE (e.g., safety glasses & ear plugs) are provided to visitors.				
MACHINE & HAND TOOL SAFETY				
Bench-top grinders are secured to the bench.				
Bench-top grinders have properly adjusted tool rests and tongue guards.				
Bench-top grinders with uneven, loaded, or grooved wheels are dressed or replaced.				
Power tools are fitted with appropriate guards.				
Machine tools are secured to the floor.				
Machine tools are locked/tagged out before blade change or repairs.				
Hand tools are kept in good working condition.				
Tools are not used in ways that are inconsistent with their design.				
CRANES & LIFTING EQUIPMENT				
Daily inspections of overhead cranes are documented by the user				
Annual inspection of overhead cranes are conducted and documented by an attached tag. (Contact Code 540 – Recert) to arrange for maintenance or inspection service).				
Only trained operators are authorized to operate cranes.				

HOUSEKEEPING, EGRESS, WALKING SURFACES	**Yes**	**No**	**N/A**	**Date Fixed**
Evacuation routes are posted conspicuously and employees have received emergency evacuation instructions.				
Evacuation plans exist to assist employees with disabilities.				
Work area, corridor & stairways are clear of clutter, debris, obstacles & electrical debris.				
Floors are kept free of oil, water, and other slip/trip hazards.				
Material is not stored on top of cabinet where it could fall.				
Emergency lighting is provided, maintained, and periodically tested.				
Exits are unobstructed and marked with “EXIT” signs.				
Employees have received Ergonomics training.				
ELECTRICAL SAFETY				
Electrical outlet receptacles located within 6 feet of water fixtures are protected with ground-fault circuit interrupters (GFCI).				
Extension cords are not used in place of permanent wiring (not to exceed 6-feet in length).				
Extension cords are not frayed, spliced, cut, or otherwise in poor condition.				
Ground conductors on three-prong plugs are in place.				
Live wires, fuses, and busses are not exposed.				
Electrical junction boxes and wire-ways have covers in place.				
Circuit breakers are labeled to indicate which breaker controls which circuit.				
Three feet of clear space is maintained in front of electrical panels.				

Notes

FLAMMABLE/HAZARDOUS CHEMICALS					***FIRE PROTECTION***				
Flammable wastes (e.g., oil or solvent rags) are discarded into an approved flammable waste container.					Fire extinguishers are readily available in the work area.				
Material Safety Data Sheets (MSDS) are available to employees for each hazardous chemical in the work area.					Fire extinguishers are fully charged and in good condition.				
Flammable liquid quantities >10 gallons are stored in UL/FM-approved flammable liquid cabinets.					Fire extinguishers have been fully inspected within the last 12 months. (Check date on extinguishers. If greater than 12 months old, notify Safety Office).				
Incompatible materials (e.g., acids & bases) are not stored together.					Items are not stored within 18 inches of sprinkler heads.				
Emergency eye washes and showers are readily accessible wherever corrosive or toxic materials are present.					Fire doors are not propped open.				

COMPRESSED GASES & COMPRESSED AIR				
Compressed gas cylinders are secured				
Compressed gas cylinders not in use have valve protection covers in place.				
Incompatible gas cylinders are adequately separated (e.g., flammables separated from oxidizers).				
Compressed air nozzles are provided with pressure reducing devices that restrict nozzle pressure to less than 30 psi.				

All items checked "NO" need to be corrected as soon as reasonable and then dated.

Signed: Manager/Supervisor	**Date:**

Notes

LABORATORY SAFETY SURVEY

Name (print) Manager/Supervisor		Org. Code
Bldg/Location	Ext.	Date

PERSONNEL SAFETY	**Yes**	**No**	**N/A**	**Date Fixed**
Personnel are trained to recognize hazards in their work place.				
Safety rules are clearly communicated and enforced.				
Safety glasses and other eye protection are available and used.				
Hearing protection equipment is available and used.				
Employees are trained in the selection and use of Personal Protection Equipment (PPE).				
PPE (e.g., safety glasses & ear plugs) are provided to visitors.				
FLAMMABLE/HAZARDOUS CHEMICALS				
Containers are labeled with content and hazard identification				
Material Safety Data Sheets (MSDS) are available to employees for each hazardous chemical in the work area.				
Flammable liquid quantities >10 gallons are stored in UL/FM-approved flammable liquid cabinets.				
Bonding and grounding devices are provided where flammable liquids are dispensed.				
Incompatible materials (e.g., acids & bases) are not stored together.				
Refrigerators used to store flammable liquids are designed, approved, and labeled for that purpose.				
Food and chemicals are not stored in the same refrigerator.				
Food is not consumed, stored, or used in laboratories.				
A Laboratory Safety Plan has been developed and is in use in each laboratory.				
Emergency eye washes and showers are readily accessible wherever corrosive or toxic materials are present.				
Emergency eye washes and showers are inspected weekly and inspections are documented.				

HOUSEKEEPING, EGRESS, WALKING SURFACES	**Yes**	**No**	**N/A**	**Date Fixed**
Evacuation routes are posted conspicuously and employees have received emergency evacuation instructions.				
Evacuation plans exist to assist employees with disabilities.				
Work area, corridor & stairways are clear of clutter, debris, obstacles & electrical debris.				
Floors are kept free of oil, water, and other slip/trip hazards.				
Material is not stored on top of cabinet where it could fall.				
Emergency lighting is provided, maintained, and periodically tested.				
Exits are unobstructed and marked with “EXIT” signs.				
Employees have received Ergonomics training.				
ELECTRICAL SAFETY				
Electrical outlet receptacles located within 6 feet of water fixtures are protected with ground-fault circuit interrupters (GFCI).				
Extension cords are not used in place of permanent wiring (not to exceed 6-feet in length).				
Extension cords are not frayed, spliced, cut, or otherwise in poor condition.				
Ground conductors on three-prong plugs are in place.				
Live wires, fuses, and busses are not exposed.				
Electrical junction boxes and wire-ways have covers in place.				
Circuit breakers are labeled to indicate which breaker controls which circuit.				
Three feet of clear space is maintained in front of electrical panels.				

Notes

COMPRESSED GASES & COMPRESSED AIR					***FIRE PROTECTION***				
Compressed gas cylinders are secured.					Fire extinguishers are fully charged and in good condition.				
Compressed gas cylinders not in use have valve protection covers in place.									
Incompatible gas cylinders are adequately separated (e.g., flammables separated from oxidizers).					Fire extinguishers have been fully inspected within the last 12 months. (Check date on extinguishers. If greater than 12 months old, notify Safety Office).				
Compressed air nozzles are provided with pressure reducing devices that restrict nozzle pressure to less than 30 psi.					Fire extinguishers are readily available in the work area.				
VENTILATION SYSTEMS AND FUME HOODS					Items are not stored within 18 inches of sprinkler heads.				
Fume hoods have current inspection stickers in place (within 6 months). Contact the Safety Office to arrange for these inspections.					Fire doors are not propped open.				
Fume hood doors are aligned with arrows while the hood is being used.									
Toxic gases are used and stored in approved toxic gas cabinets.									

All items checked "NO" need to be corrected as soon as reasonable and then dated.

Signed: Manager/Supervisor	**Date:**

Notes

3.4 Other Hazard Analyses

Other work area hazard analyses are performed periodically by various organizations. These work area assessments are not intended to replace the monthly inspection, however, information derived from these assessments can be used to supplement or enhance the Work Center monthly inspection process. The following list of assessments may affect your Work Center.

Table 3.4 Other Work Center Hazard Analyses

Assessment	Target	Frequency
Industrial Hygiene Baseline Survey	Worker Exposure to- Chemicals, Noise, ionizing and non-ionizing radiation, heat, cold, ergonomic issues, biohazards	Initial facility wide, new process or change in process. Follow up assessments may be required annually.
Safety Office - Safety and Health Program Assessments	Government and Contractor Safety Program evaluations. Work area and facility safety assessments	Annual Follow up inspections may be performed to verify closure of findings
Performance Evaluation Profile (PEP) Survey	Desk top survey – Worker and Supervisor perception of job safety	Approximately every 12 -18 months
NASA Headquarters Environmental Health Audit	Industrial Hygiene, Health Physics (ionizing non-ionizing radiation, lasers), Medical facilities, physical fitness facilities, food services	Every two years
OSHA inspections	Formal written worker complaint, Mishap investigation [work related death or catastrophe (3 or more workers hospitalized)]	(hopefully never)
Safety Office Evaluations and Investigations	1) Worker or supervisor safety or health concern 2) Identified hazards, mishaps, close calls	1) Safety and health concerns - as requested 2) Hazards, mishaps, close calls – as situation dictates
Mishap/Close Call Investigations	1) Category 1 and 2 Mishaps will be conducted by a NASA appointed Investigation Board 2) Category 3 Mishap and Close call reports conducted by WFF Safety Office and Supervisors	When a Mishap occurs or a Close Call is reported

3.5 External Assessment Findings

Implementation of corrective actions for work center process related assessment findings are the responsibility of the work center supervisor. The supervisor will need to inform workers of external assessment findings as they relate to workers job duties and develop and implement corrective actions based on the assessment findings. Facility related findings are the work center supervisor's responsibility in so far as they may impact the work center workforce. The supervisor will inform the workforce of facility related findings as appropriate and track the implementation of corrective actions. The Safety Office is available to assist the work centers with the closure of findings identified during external assessments.

3.6 Mishap Reporting and Investigation, and Close Calls

A mishap is an event that causes unplanned or unexpected death, injury, or loss or damage of property. For example, death or injury to a test subject is a mishap. Failure of a test object isn't a mishap if you expected it to occur as a potential result of the test. WFF has the following categories of mishaps:

a. ***Type A*** – mishaps that result in death or equipment or property damage equal to or greater than $1 million.
b. ***Type B*** – mishaps that result in any of the following:
    - Permanent disability
    - Hospitalization of three or more persons for more than observation
    - Property damage equal to or greater than $250,000 and less than $1 million
c. ***Type C*** – mishaps that result in lost time injuries or illnesses less than type B or equipment or property damage equal to or greater than $25,000 and less than $250,000.
d. ***Incidents*** – mishaps that result in medical treatment (more serious than first aid cases) injuries without lost time or equipment or property damage greater than or equal to $1,000 and less than $25,000.
e. **First Aid Cases** – mishaps that result in injuries needing only first aid treatment.

Mishap Reporting
If a mishap occurs in your area, you must follow these steps:

a. Call your emergency number if the mishap is an emergency. Emergencies include:
    - Mishaps that cause major injuries to one or more persons or major property damage
    - Mishaps that result in a condition that is immediately dangerous to life or health
    - Any unplanned or uncontrolled hazardous material spills
    - Any unplanned fire or explosion

- Mishaps that require prompt emergency response

Remember, your emergency number at WFF is 911.

b. Prevent further injury or damage.

c. Secure the mishap scene.

d. Safeguard mishap evidence.

e. Report the mishap as to the Safety Office at extension 1486 or 2518

f. If you think the mishap could be a type A or B, contact the Safety Office or the Code 800 Director's Office immediately.

The Office of Public Affairs is the only organization allowed to coordinate releases of information to the news media.

Mishaps must be reported immediately to the Safety Office by telephone and your supervisor as soon as possible. The supervisor must then complete and sign an initial written report within 1 working day on NASA Form 1627 and send it to the Safety Office.

NASA Form 1627

If you, as a supervisor, have a mishap in your area you must do the following:

- Complete and sign an initial written report on NASA Form 1627, blocks 1-22, 27, 28, 32, and 33, within 1 working day after you find out about the mishap.
- Send the NASA Form 1627 to the Safety Office.

(See Appendix A NASA Form 1627)

Mishap Investigation

Type A and B Mishaps will be investigated by a NASA appointed investigation team. The Investigation team will need the full cooperation of the Work Center supervisor and workers.

Type C Mishaps will be investigated by the supervisor and/or the WFF Safety Office depending on the circumstances. If a type C mishap occurs in your Work Center the supervisor is required to do the following:

a. Complete NASA Form 1627 after you investigate the mishap, document your corrective action in block 34, and sign block 35. You must complete this within 10 working days or ask for an extension from the Safety Office.

b. Have your facility operations manager concur on the corrective action if the mishap involved the building or hazardous materials.

c. Have your supervisor, program manager, or contract project manager sign the form in block 35.

d. Send the completed form to the Safety Office. If the Safety Office agrees with the corrective action, the Safety Office will close the report and let the supervisor know that the report is closed.

e. Provide follow-up data such as total time lost from work, end of restricted duty, or final costs to the Safety Office as needed.

Close Calls

NASA defines a close call as - An occurrence or a condition of employee concern in which there is no injury or only minor injury requiring first aid and no significant equipment/property damage (less than $1000), but which possesses a potential to cause a mishap.

Close calls are Investigation and corrective actions implemented in the same manner as Type C Mishaps. Corrective actions shall be tracked to completion.

3.7 Risk Assessment Codes

Risk Assessment Codes (RAC) is a system used to rank the risk posed by hazards. The lower the RAC the greater the risk and the sooner corrective actions need to be implemented. Risk considers both the severity of a mishap that could result from a hazard and the chance the mishap could occur. This tells you how serious the hazard is and helps you decide which hazards to correct first. You must document both the risk assessment before controls are in place and the risk assessment after controls are in place. Use a RAC matrix to assess the risk of each hazard:

a. Find the severity or the worst-case outcome of a mishap from the hazard along the left side of the matrix.

b. Find the frequency or probability that you expect the mishap to occur across the top of the matrix.

c. Find the RAC in the box where the “severity” and “frequency” cross.

TABLE 3.7a RISK ASSESSMENT CODE - SEVERITY ESTIMATION

		PROBABILITY ESTIMATE (FREQUENCY)				
		A **Frequent** Likely to occur one or more times a year	**B** **Probable** Likely to occur once in 1 - 2 years	**C** **Occasional** May occur once in 2 - 5 years	**D** **remote** Unlikely to occur, but possible within 5 years to end of system life	**E** **Improbable to occur**
SEVERITY	**I Catastrophic** Death, several serious injuries or illnesses, or Damage over $1,000,000	1	1	2	3	4
	II Critical Serious injury or illness, several lost workdays, or Damage between $250,000-$1,000,000	1	2	3	4	5
	III Marginal Lost workday, several minor injuries, or Damage between $25,000-$250,000	2	3	4	5	6
	IV Negligible Minor injury or Damage less than $25,000	3	4	5	6	7

Table 3.7b Timeline for Implementing Corrective Actions

The table below tells you what action you must take for each RAC.

If the RAC is ...	***Then the ACTION is . . .***
1	Unacceptable - Correct within 24 hours using temporary or permanent engineering or administrative controls to reduce the hazard to a RAC 3 or 4. All operations must cease immediately until the hazard is corrected or until temporary controls are in place and permanent controls are in work. A safety professional should stay at the scene at least until temporary controls are in place.

2	Undesirable - Correct within 3 working days using engineering or administrative controls to reduce the hazard to a RAC 3, 4 or less. All operations must cease immediately until the hazard is corrected or until temporary controls are in place and permanent controls are in work. The Program Manager, Campaign Manager, or Center Director may accept the risk with adequate justification.
3	Acceptable with controls - Correct hazard within 30 days and verify that documented procedures and controls are in place. Organizational Director (codes 200, 500, 800, etc.) or equivalent management may accept the risk with adequate justification.
4,5,6,or 7	Acceptable with controls - Correct hazard within 90 days. Branch Heads/Office Chiefs or equivalent management may accept the risk with adequate justification.

3.8 Hazard Analysis - Prior Use Or Change In Service

When new processes, materials, equipment or facilities are planned; or changes to existing activities are planned; a prior use or change in service hazard analysis must be performed. Notify the Safety Office with as much lead time as possible and the Safety Office with your assistance shall conduct the analysis. When these activities affect your work center the supervisor will need to modify and existing JHA or create a new JHA for the work to be performed.

3.9 Support Services

Safety is everyone's duty and responsibility. The Safety Office is here to provide support for your organization to help you be successful in achieving and maintaining a safe work environment. To help us reach our goal the Safety Office provides for your reference the following list of services. Contact the Safety Office at ext. 2559 or 2518 to coordinate services.

JHA Preparation
Mishap, Close Call, Or Hazard Investigation
Ionizing Or Non-Ionizing Radiation Assessments
Illumination Evaluations
Ergonomic Evaluations
Confined Space Entry
Personal Protective Equipment Evaluations
Engineering Controls
Training and Safety Talks
Regulatory Interpretation
Work Area Inspections
Corrective Actions And Tracking
Prior Use Or Change In Service Hazard Analysis
Trend Analysis
Noise Assessments
Chemical Exposure
Indoor Air Quality Issues
Risk Assessment Codes
Plans Preparation and Implementation

3.10 Tracking and Trending

Each Work Center should track finds to closure and periodically conduct a trend analysis to determine if any patterns can be identified and corrective action taken. The Safety Office has a software program for tracking and trending hazards. The Safety Office will make this program available to each Work Center and provide training on how to use the program.

3.11 Hazard Abatement Form

Safety and Health Hazard Abatement Plan		
Type of Abatement Action (title or brief description):		Discrepancy Number:
Code:	Building or Location:	
Hazard Description:		
Standard, Regulation or Procedure Violated:		Risk Code:
Program Impact:		
Corrective Action Required:		
Coordination Requirements:		
Estimated Cost:	Funds Source:	Abatement Time:
Reason For Delay:		
Interim Protection:		
Action Officers Name:		
Action Officers Signature:		Date
Concurrences		
Safety/Health Director	Signature	Date
FOM	Signature	Date
Finance Officer	Signature	Date
Other (Specify)	Signature	Date

3.12 PEP Survey Questions

Survey questions are answered using the following Scale:
(Disagree) 1 2 3 4 5 (Agree) N/A Don't Know
Work Centers should strive to achieve 4's and 5's on all questions

EMPLOYEE QUESTIONS

1. I am encouraged and authorized to stop unsafe activities that can lead to serious safety or health incidents.

2. I have the opportunity to review the hazards and controls identified in my workplace.

3. I am encouraged to provide inputs and suggestions for the purpose of improving the safe work area.

4. I am encouraged work area to identify safety and health hazards.

5. Safety inspection results are made available to employees for review and information.

6. A Close Call reporting system is used to provide an effective mean or calling attention to health problems.

7. I am provided with a safe and healthful environment.

8. Employees participate in safety inspections of facilities and operations in my work area.

9. A hazard analysis has been conducted for my job and is updated as necessary.

10. Regular surveys (walk-through), which Include employee representatives such as myself, are conducted to evaluate safety hazards and controls.

11. I am satisfied that I have been adequately informed about the hazards associated with job.

12. Hazard emulation is a goal of my work area.

13. When hazard elimination is not possible, other controls (such as reduction of exposure, the use of barriers and guards, the use of personal protective equipment (PPE), and procedural work-around techniques) are used.

14. Employee input into safety inspections in my work area is encouraged.

15. Safe inspections are performed In my work area, and the results are documented.

16. Safety follow-up inspections are conducted in my work area to verify that identified hazards have been properly eliminated or controlled.

17. I believe the hazard and close-call reporting systems are effective tools in reducing the work area.

18. I am familiar with the procedures for formally reporting hazards and close-calls In my work area.

19. Open hazards or safety deficiencies which could affect employees in my work area are made known to workers.

20. I am satisfied that reported hazards are promptly eliminated/controlled in my work area.

21. I am aware of the NASA Safety Reporting System (NSRS).

22. I am encouraged to report close calls which occur in my work area.

23. All loss-producing mishaps and close calls that occur in my work area are investigated to determine root cause.

24. Employees from my work area participate in mishap and close-call investigations.

25. If you have submitted a Close-call report, did you receive prompt attention and timely response?

26. There is a clear top to down commitment to mishap avoidance in my work area.

27. Mishap prevention information (posters, signs) is posted in my work area.

28. Mishap Investigation and prevention includes consideration of the potential for ergonomic injuries.

29. Statistical mishap and Injury data are regularly collected for my organization as required by OSHA.

30. An analysis to Identify high risk problem areas and jobs has been conducted for the facility in which I work.

31. Information Is available regarding injuries and illnesses that occur in my work area.

32. I am informed of the most common injury types (I.e. slips, trips, falls, etc.) that occur in m work area.

33. I am aware that analyses are conducted to Identify hazard control requirements for my work place and that they are updated as needed.

34. Adherence to NASA, OSHA, and industry standards for hazard control is required In my work area.

35. The equipment necessary to effectively control the hazards in my workplace is in place and periodically inspected.

36. I am confident that each piece of equipment that I use is adequately maintained and is safe to operate.

37. Health assessments are conducted in my work area to assure a healthy work environment.

38. If I have a question regarding operations in which health hazards exist, I can get answers from the Occupational Health staff at my Center.

39. When unique health risks (air quality, water quality, asbestos, etc.) are Identified In my work area an accident investigation is provided to analyze and resolve the issues

40. Ergonomic evaluations are Included as a part of the health assessments for my work area.

MANAGER/SUPERVISOR QUESTIONS

1. Workers, or their representatives, can participate freely in safety and health activities at the worksite without fear of reprisal procedures are in place for communication between employer and workers on safety and health matters. Worker rights under the Occupational Safety and Health Act to refuse or stop work that they reasonably believe involves imminent danger are understood by workers and honored by management. Employee procedures are documented and in place for dealing with emergencies in the workplace. Emergency equipment (fire pull boxes, fire extinguishers, first aid kits, etc.) is available.

2. Workers and their representatives have access to all pertinent health and safety information, including safety reports and audits. Workers are informed of their right to refuse job assignments that pose serious hazard to themselves pending management response. A Close Call reporting system is used to bring attention to potential safety and health problems.

3. All employees, including new hires, are notified of the Center's safety goals. Employees are assured of their right to complain to OSHA. Employers encourage and authorize employees to stop unsafe activities that can lead to serious safety and health incidents. Two-way safety communications between supervisors and employees are open and encouraged.

4. Surveys for violations of safety and health standards are conducted by knowledgeable person(s) and documented. Current hazard analyses are written (where appropriate) for all high-hazard jobs and processes; analyses are communicated to and understood by affected employees. Hazard analyses are conducted for jobs tasks and workstations, where injury or Illnesses have been recorded.

5. Methodical surveys (walk-through) are conducted periodically and drive appropriate corrective action. Knowledgeable persons review all plan/changed/new facilities, processes, materials or equipment. Hazard elimination is the goal. When hazard elimination is not possible, appropriate hazard controls are used. A job hazard analysis has been conducted for all jobs in the organization.

6. Management always involves the employees in the reviews and analyses of the facilities and operations. Regular surveys, including documented comprehensive workplace hazard evaluations, are conducted by certified safety and health professionals. Corrective action is documented and hazard inventories are updated.

7. Supervisors dedicate time to observing work practices and other safety and health conditions in work areas where they have responsibility. Management has established a periodic inspection process to review and inspect facilities and work places. Competent personnel conduct inspections with appropriate involvement of employees. Items in need of correction are documented. Inspections include compliance with relevant Industry standards. Time periods for correction are set.

8. Trained employees conduct inspections, and all items are corrected promptly and appropriate workplace inspections are planned, with key observations or check points defined and results documented. Persons conducting Inspections have specific training in hazard identification applicable to the facility. At a minimum the entire worksite is inspected at least each quarter.

9. Inspections are performed to include safety and health professionals, line management, and worksite personnel, and are always documented and corrective action tracked.

10. Management has established a formal system for hazard reporting. Employees use the system with no risk of reprisals. Employee reports of hazards are documented, corrective action is scheduled, and records maintained. Open hazards, on the average, are closed within a month. Directors or managers review open hazard reports.

11. Employees are periodically instructed in identification and reporting procedures. Open hazards, on the average are closed within 5 working days. Management conducts surveys of employee’s observations of hazards to ensure that the system is working. Results are documented. Hazards and close-calls are expeditiously reviewed and feedback is provided to the report originator.

12. Management has a written process for motivating to identify and report hazards and close calls related to safety rules and processes. Records are kept on this process. Management responds in writing to reports of hazards within specified timeframes. The workforce readily identifies and corrects hazards: they are supported by management when they do so. Open hazard notices are always posted for employee notification. Management periodically reviews the status of close calls, hazard reports, and mishap report close outs. Line management analyses mishap reports, close calls hazard reports to identify trends, improvements to be made or other areas that need improvement.

13. Investigation of incidents are conducted and supervisors prepare injury reports for lost time cases. Reports are prepared with cause identification and corrective measures prescribed. Corrective measures are used as a means for mishap prevention.

14. Report's and recommendations are available to employees. Quality and completeness of investigations are systematically reviewed by trained safety personnel. Close calls and hazard reports are reviewed and analyzed by Safety and Health Committees. Supervisors and employee representatives investigate first aid and Type C mishaps.

15. All loss-producing mishaps and close calls are investigated for root causes by teams of Individuals that include trained safety personnel and employees. Management has established a process to report all close calls and hazards, and employees are rewarded for reporting them. Type B and Type A potential mishaps are reported to the Director and Safety Office immediately so that a board of Investigation can be appointed.

16. Injury and illness data is collected and analyzed, records are maintained, and rates are calculated so as to identify high risk areas and jobs. Significant analytical Findings are used for prevention.

17. Management has established a process to identify the frequent and most severe problem areas, the high-risk areas, the high risk areas and job classifications, and any exposures responsible for recorded cases. Data is fully analyzed and effectively communicated to employees. Injury/illnesses data is audited and certified by a responsible person.

18. Personnel trained in advanced first aid and/or emergency medical care is always available on site. A health care provider is on site for each production shift. Emergency services including provisions for ambulances, EMTs, emergency clinics or hospital emergency rooms are provided on site.

SECTION 4 HAZARD PREVENTION AND CONTROLS

4.0 Introduction

Workplace hazards need to be eliminated whenever possible to prevent mishaps from occurring. When a hazard cannot be eliminated it must be controlled to reduce the potential of an injury or illness occurring. In many instances multiple controls may need to be implemented to minimize the hazard. Hazard prevention and control should begin in the design phase for all new or modified operations and be continuously improved throughout the life of the operation. The following list provides a hierarchy of controls methods, in order of preferred implementation, ranging from elimination the most desirable to personal protective equipment the least desirable.

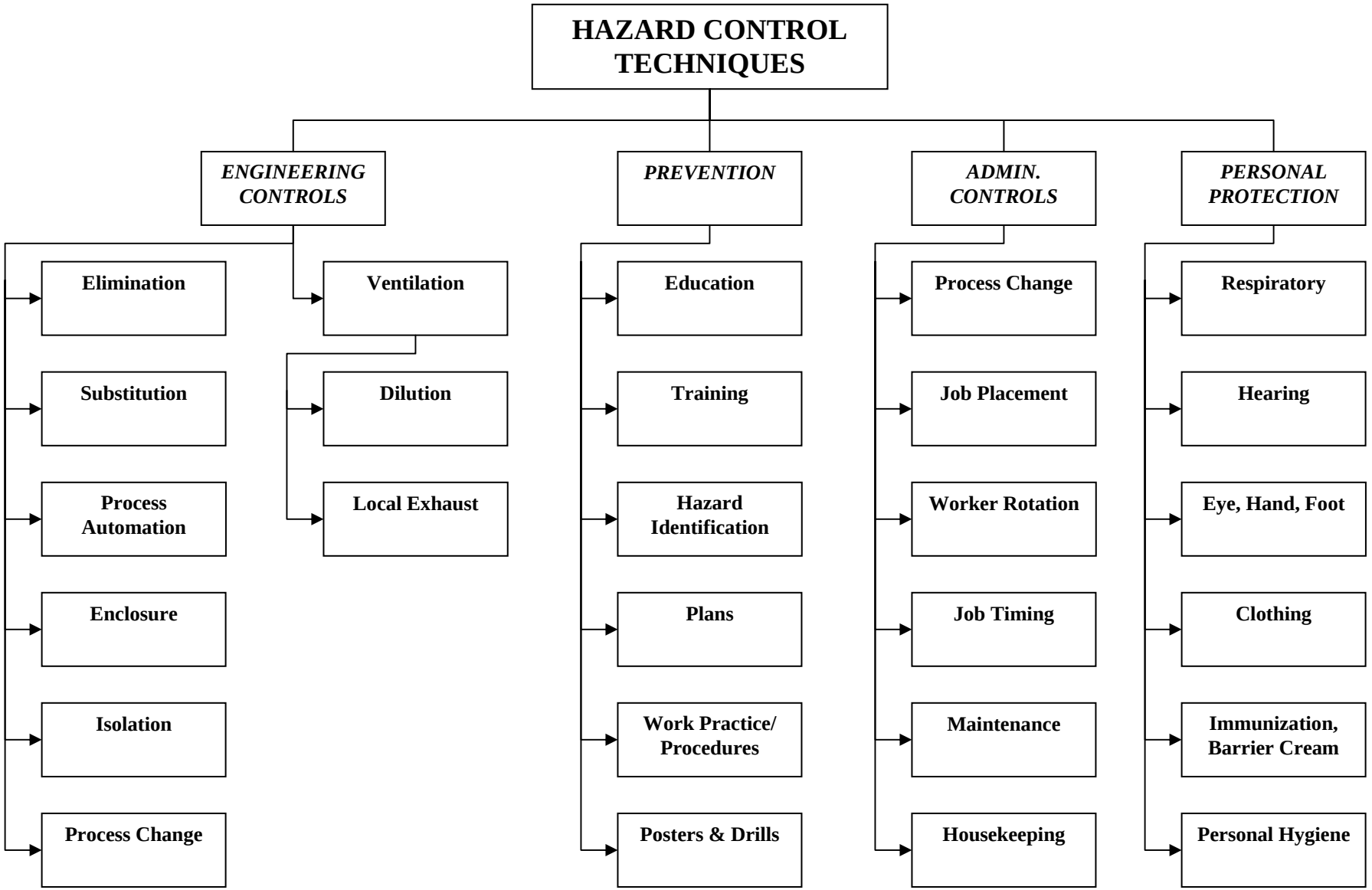
- Engineering controls to include - Eliminate/substitute the hazard
- Prevention
- Administrative controls
- Personal protective equipment

Hazards should be eliminated or substitutes made whenever possible. Substitution is the replacement of a hazardous material or activity with a non-hazardous or less hazardous material or activity. Examples of substitution include replacing a hazardous chemical with a less hazardous or non-hazardous chemical or replacing manual material handling with mechanical material handling.

Engineering controls are the preferred method of controlling hazards when a hazard can not be eliminated. Engineering controls are less dependent upon human factors and place less of a burden on the worker. Prevention is the proactive approach to identifying and eliminating or correcting hazards before they become close call or mishaps. Administrative controls are focus on reducing the workers exposure to hazards and personal protective equipment is the last line of defense between the hazard and the worker. Table 4.1 provides a brief categorization of hazard control techniques.

Hazard prevention and controls are job dependent and each job needs to be evaluated and the best control method(s) implemented to minimize risk. The hazard control evaluation needs to be in writing. A written hazard control plan can be prepared for the work center or the JHA form may be adequate to address this requirement. Safe work procedures should be prepared for the work performed and workers need to understand and adhere to the procedures and controls necessary to reduce the risk of injury.

Table 4.0


HAZARD CONTROL TECHNIQUES
ENGINEERING CONTROLS
PREVENTION
ADMIN. CONTROLS
PERSONAL PROTECTION
Elimination
Substitution
Process Automation
Enclosure
Isolation
Process Change
Ventilation
Dilution
Local Exhaust
Education
Training
Hazard Identification
Plans
Work Practice/ Procedures
Posters & Drills
Process Change
Job Placement
Worker Rotation
Job Timing
Maintenance
Housekeeping
Respiratory
Hearing
Eye, Hand, Foot
Clothing
Immunization, Barrier Cream
Personal Hygiene

4.1 Hazardous Operations

NASA has identified three categories of 'Hazardous Operations' that require additional attention. A hazardous operation in these categories is defined as a job that involves hazardous materials, conditions, or equipment that could result in death, injury, or property damage if special precautions are not followed.

Table 4.1 Hazardous Operations Categories

CATEGORY	REQUIREMENT
Category 1: Activities involving operations that are likely to either cause death or serious injury to any employee or member of the public or high-dollar property damage for WFF. Typical WFF category 1 operations include handling pyrotechnics and explosives, permit required confined space entry, firefighting inside burning buildings, and operation of high pressure systems Additional examples of Category 1 activities are available in NPG 8715.3 - 4.4.2	a. Classroom or on-the-job training for initial certification and then as needed. b. Written examination or experience review by line management. c. Annual retraining that will include review of emergency response and first aid procedures. d. Re-certification as often as necessary (not to exceed 4 yrs.) e. Physical examination if required by the Health Unit. f. Buddy System Required
Category 2: Jobs involve operations that, if not done correctly, could create a severe hazard to the operator or user, other personnel, or property. The requirements for category II jobs are similar to those for category 1 jobs. You may reduce the levels of physical examination, training, and testing because of the lower hazard levels. The organization must determine the certification and re-certification requirements with the concurrence of the WFF Safety Office. The "buddy system" may or may not be required depending on established controls.	a. Classroom or on-the-job training for initial certification and then as needed. b. Written examination or experience review by line management. c. Retraining as necessary d. Re-certification as necessary. e. Physical examination if required by the Health Unit. f. Buddy System
Category 3: Jobs involving handling, transporting, and packaging of hazardous materials that do not disturb the integrity of the basic shipping container. Operations that involve the reduction of palletized or otherwise combined items of packaged hazardous materials qualify as handling. Category III jobs require training and certification and a hazardous operations permit unless you have a procedure to eliminate or control all hazards and potential hazards. Your organization will determine the certification period with concurrence from the WFF Safety Office.	a. Have specific training in federal, NASA, and WFF rules for preparing, packaging, marking, and transporting the material you will handle. b. Pass a written test to show you have the necessary knowledge and skills.

Each Work Center needs to create a list of hazardous operations in their work areas, develop safe work procedures for these operations, implement control measures, and conduct worker training accordingly. Safe work procedures need to be updated whenever there are changes or modifications to the process or when a mishap or close call occurs. Workers need to be informed of the changes and retrained or recertified as necessary.

4.1.1 Work Center Hazardous Operations

4.2 Work Center Plans (Preparation and/or Implementation)

Each Work Center needs to implement several hazard prevention plans. Work Center personnel need to be aware of the plans as they apply to their work and trained according to the plan requirements. All work centers need to implement a Hazard Communication Plan, Emergency Evacuation Plan, and Severe Weather Preparedness Plan. Other plans may need to be developed and/or implemented depending on work center operations.

4.2.1 Hazard Communication Plan (HazCom)

HazCom can be looked at as a two part process consisting of a general or awareness level and a user level. All Work Centers and employees should receive annual awareness level training. The WFF written HazCom Plan can be found in Appendix A of the WFF Safety Manual URL - http://www.wff.nasa.gov/~code803/restricted/processes.html and in Appendix C of this document.

A Work Center site specific written HazCom program is required for all Work Center where employees may come in contact with chemicals during normal working conditions, or in a foreseeable emergency. Under this program employees will be informed of the chemicals they will use or potentially exposed to, safe handling procedures, and measures to protect themselves from these chemicals. A template for a Work Center site specific HazCom is available in the written program.

4.2.2 Emergency Evacuation Plan

The preparation of a buildings Emergency Evacuation Plan is the responsibility of the building FOM. The Work Center supervisor should review the Evacuation Plan to determine if the plan meets the work centers needs. The emergency action plan should address emergencies that may reasonably be expected in the workplace. Examples are: fire; toxic chemical releases; hurricanes; tornadoes; blizzards; floods; and others. OSHA has identified several key elements that are required to be in the Plan.

Emergency action plan elements (OSHA 29 CFR 1910 Subpart E)

- Procedures to be taken by those employees who have been selected to remain behind to care for essential operations until their evacuation are absolutely necessary. Essential operations may include the monitoring of plant power supplies, water supplies, and other essential services which cannot be shut down for every emergency alarm.

- The use of floor plans or workplace maps which clearly show the emergency escape routes. Color coding will aid employees in determining their route assignments. Floor Plan escape routes are to be in the written plan and posted near entrances/exits.

- Develop and explain in detail what rescue and medical first aid duties are to be performed and by whom. All employees are to be told what actions they are to take in emergency situations.

- Emergency evacuation procedure. At the time of an emergency, employees should know what type of evacuation is necessary and what their role is in carrying out the plan.

- Designation of a refuge or safe area(s) for evacuation should be determined and identified in the plan. (Typically the area inside a building is the stairwells because they are fire rated) Workers and visitors identified as needing assistance (Disabled personnel) during an evaluation shall be assigned a "buddy" to assist them in reaching the safe refuge area in the event of an emergency.

- Exterior refuge or safe areas may include parking lots, open fields or streets which are located away from the site of the emergency and which provide sufficient space to accommodate the employees.

- Emergency action plan training.

- All FOMs, wardens, and fellow employees should be made aware of handicapped employees who may need extra assistance, such as using the buddy system, and of hazardous areas to be avoided during emergencies. Before leaving, wardens should check rooms and other enclosed spaces in the workplace for employees who may be trapped or unable to evacuate the area.

- After the desired degree of evacuation is completed, the wardens should be able to account for or otherwise verify that all employees are in the safe areas and notify the FOM and Fire Department.

- Fire prevention housekeeping. The plan should calls for the control of accumulations of flammable and combustible waste materials.

NASA Fire Protection Program

Your minimum fire safety requirements and guidelines applicable to NASA Headquarters and all NASA Centers are found in NASA-STD-8719.11

This standard can be accessed on-line at:
http://www.hq.nasa.gov/office/codeq/doctree/871911.pdf

If you have specific fire safety requirement questions, you may contact the Wallops Fire Station at extension 1300.

4.2.3 Hurricane and Severe Weather Preparedness Plan

Each Work Center should review the Hurricane Plan (http://www.wff.nasa.gov/~code803/restricted/processes.html) and determine what actions their group will need take to implement the plan in the event of severe weather. The Work Center may need to secure outside equipment, identify key personnel, notify personnel on and off the facility, shut down equipment or reschedule projects. The Work Center should consider other environmental factors that may impact the work they perform and determine if contingency plans should be prepared and implemented. Factors that affecting Work Center activities may include: high winds, lightning, flooding, and temperature extremes

4.2.4 Chemical Hygiene Plan

Laboratories where chemicals are used, are required to prepare a Chemical Hygiene Plan (required by OSHA's 29 CFR 1910.1450 standard). This document contains the general and specific procedures and processes managed within the organization's laboratory. GPG 1700.2, entitled "Chemical Hygiene Program," is currently in process to replace the old GSFC Chemical Hygiene Plan (GHB 1790.1). The GPG, in review on GDMS, contains general GSFC laboratory safety procedures for laboratories doing chemical research. Each individual laboratory must then prepare laboratory-unique documentation that discusses local organizational personnel, practices, and procedures. The GSFC Chemical Hygiene Plan is further augmented by Hazardous Chemical Storage Guidelines and General Chemical Hygiene Training Information, both of which are downloadable from the GSFC Safety 1st Web site http://safety1st.gsfc.nasa.gov/. Sample templates to handle laboratory-specific requirements can be downloaded as well.

4.2.5 Hearing Conservation Plan

All personnel who are routinely, occupationally exposed to noise at levels equal to or exceeding the following noise levels will be identified and placed in a hearing conservation program and be required to wear personal hearing protection.

- The action level of 80 Decibel A-Weight (dBA), as an 8-hour Time Weighted Average (TWA), for 30 or more days per year; or
- An equivalent TWA of 85 dBA for 8 hours for any 1 day per year; or
- Impact or impulsive noise in excess of the limits listed in Table 2.
- All personnel who enter designated hazardous noise areas or who perform tasks where exposures to continuous noise exceed 85 dBA, regardless of the duration of exposure, will be required to wear personal hearing protection.

A Work Center that has personnel that met these criteria is required to participate in the WFF Hearing Conservation Program. The WFF program can be found in Appendix B of the WFF Safety Manual http://www.wff.nasa.gov/~code803/restricted/processes.html

4.2.6 Respiratory Protection Plan

Respirators are used in the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to this section.

Goddard's respiratory protection plan is currently being drafted. If inhalation hazard are suspected in your Work Center contact the Safety Office for direction.

4.2.7 Radiation Protection Plan

Radiation protection needs to be addressed by the Work Center when personnel are working with ionizing or non-ionizing radiation. Ionizing Radiation is addressed in Ionizing Radiation GPG 1860.1 and laser use is addressed in Laser Safety GPG 1860.2

4.2.8 Personal Protective Equipment (PPE) Plan

PPE takes on many forms depending on the hazard and should be identified for each task in the Job Hazard Analysis process. PPE is considered the last line of defense and should be used as a precaution in the event of engineering control failure or for emergency response situation. It is imperative that PPE be selected based on the hazard or potential hazard. Contact the Safety Office with any questions that may arise concerning PPE.

4.2.8.1 PPE Types and Uses

The following list of PPE is not all inclusive and is intended only for awareness.

Head Protection

- Hard hats and bump hats; various hard hats are available depending on the level of impact protection needed and potential electrical hazards.
- Other head protection may be needed for temperature protection; ear muffs, insulated hats or hood, thermal shielding.

Respiratory Protection

- Dust Masks – for nuisances dust, not for use in hazardous atmospheres.
- Air purifying (AP) respirators use cartridges to filter airborne contaminants (do not use in oxygen deficient atmospheres). Available in ½ face AP, full face AP, and powered air AP.
- Airline respirators with emergency escape bottles.
- Self Contained Breathing Apparatus (SCBA)

Eye Protection

- Safety Glasses (with and without UV protection)

- Goggles
- Face shields and Safety Glasses (safety glasses should always be worn under face shields)
- Laser hazard goggles
- Welding or cutting - glasses or helmets

Protective Clothing for skin protection

- Arm or leg guards
- Shoe covers
- Head covers
- Overalls or suits – cloth or chemical resistance (various levels of chemical resistance are available up to fully encapsulated suits)

Hearing Protection

- Ear plugs (may varieties contact the Safety Office to verify noise reduction rating NRR)
- Ear Muffs
- Duel ear plugs and muffs
- Active noise attenuation systems

Foot Protection

- Safety shoes or boots (depending on the potential hazards can have steel toes, steel shanks, or metatarsal guard)
- Water resistant soles
- Boots, waders, hip boots
- Electrically conductive footwear.

Other

- Immunizations
- Barrier Cream
- Personal hygiene

4.2.8.2 PPE Training Requirements

Worker training is required when <u>any</u> form of PPE is used. Workers must be trained on how to use it, the PPE's limitations, and proper care and maintenance of the PPE. Training must also be documented. Before an employee uses a respirator they must first pass a physical examination and obtain the doctors written approval (this does not apply to dust masks used for nuisance dust)

4.3 PEP Survey Questions

Survey questions are answered using the following Scale:
(Disagree) 1 2 3 4 5 (Agree) N/A Don't Know
Work Centers should strive to achieve 4's and 5's on all questions

EMPLOYEE QUESTIONS

1. I am confident that I know the proper procedure to deal with any emergency that may occur in my work area.

2. I am aware of the locations of emergency equipment (fire pull boxes, extinguishers, first aid kits) used in my workplace to deal with emergencies.

3. I am familiar with the names and locations of the safety representatives (fire wardens, facility safety reps, etc.) for my work area.

4. I am confident that each piece of equipment that I use is adequately maintained and is safe to operate.

5. If identified as a job requirement, I receive physical examinations consistent with specific medical requirements associated with my job.

6. If required, a documented Personal Protective Equipment (PPE) program, including fit-testing and maintenance (of respirators, clothing, etc.), is in place and strictly enforced in my work area.

7. I am made aware of emergency plan in my area.

8. Emergency plans are evaluated at least annually.

9. Emergency procedures exist for all potential hazards in my work area.

10. I participate in regular drills to learn and practice emergency procedures.

11. Equipment is available in my work area to adequately control all identified emergencies.

12. Natural disaster emergency response plans (severe weather, fire, etc.) exist for my work area.

13. Fire and emergency rescue personnel are available to my worksite.

14. Adequate fire and rescue equipment is available to my worksite.

15. Trained personnel provide emergency services for my worksite which include provisions for ambulance, EMT's, or emergency rooms.

16. It is my belief that response time to my worksite of appropriate emergency equipment and personnel will be at a minimum.

17. Personnel trained in first-aid, CPR, and medical care is available from within my work area.

MANAGER/SUPERVISOR QUESTIONS

1. Hazard controls are in place effective and complete. Hazards that have caused past injuries in the facility have been corrected. The work center is in compliance with voluntary standards, industry practices, and supplier's safety recommendations. Documented reviews of needs in machine guarding, energy lockout, ergonomics, materials handling, blood-borne pathogens, confined space, hazard communication, and other generally applicable standards have been conducted. The overall program tolerates occasional deviations.

2. Managers and supervisors require strict and complete compliance with all site, consensus, and industry standards and recommendations. All deviations are identified and causes determined. All equipment and instrumentation are properly calibrated and are adequate for support of an effective occupational safety and health program.

3. Hazard controls are fully in place and continually improved upon based on workplace experience and general knowledge. Documented reviews of needs are conducted by certified health and safety professionals. There is a process in place to control the accountability of instrumentation, equipment, and supplies. Funding resources are available for abatement of occupational health and safety hazards.

4. An equipment maintenance schedule is implemented; it is followed under normal circumstances. Manufacturers' and industry recommendations for maintenance frequency are complied with. Breakdown repairs for safety related items are expedited. Safety device checks are documented.

5. Maintenance plans and operations procedures are regularly reviewed for adequacy. Maintenance changes are expeditiously implemented following in change in facility or process control. The employer has effectively implemented

6. Hazard controls are fully in place and continually improved upon based on work place experience and general knowledge. Documented reviews of needs are conducted by certified health and safety professionals. There is a process in place to control the accountability of instrumentation, equipment and supplies. Funding resources are available for abatement of occupational health and safety hazards.

7. Required medical surveillance, monitoring, and reporting responsibilities are assigned and carried out to comply with applicable standards. Employees report early signs/symptoms of job-related injury or illnesses and receive appropriate treatment. A PPE program is in place.

8. Health care providers provide follow-up on employee treatment protocols and are involved in hazard identification and control in the workplace. Medical surveillance addresses conditions not covered by specific standards. Potential health hazards have been identified

by appropriately qualified personnel utilizing a complete industrial hygiene surveyor a complete process hazards review. There is an adequate control of accountability of Instrumentation, equipment, and supplies. There are funding resources available for abatement of occupational health hazards. A program that strictly enforces the rules that determine when to use PPE end whet type is in lace. Ergonomic considerations are a part of the medical program.

9. Occupational health personnel are available to respond to health and hygiene Questions and are fully involved in hazard identification and training. Management has a scheduled program for periodic monitoring and sampling of any Identified problem areas. Monitoring and sampling are conducted by appropriately trained personnel with results available for OSHA's review. Standard, nationally recognized procedures are used for surveying and sampling, as well as testing and analysis. PPE is properly used in conjunction with engineering and administrative controls, a written respirator program, as well as appropriate training, Is In place and implemented where respirators are needed. Availability, fit-testing, and maintenance are included as part of the PPE program responsibility. Economic evaluations are a part of workplace health assessments.

10. Emergency response plans for fire, chemical, and weather emergencies as required by site policy are present. Training is conducted as required by the standard. Appropriate alarm systems are present. Employees are trained in emergency procedures. The emergency response extends to spills and incidents in routine production. Adequate supply of spill control and PPE appropriate to hazards on site are available.

11. Emergency response plans have been developed by qualified safety and health professionals and are updated annually. Regular drills are conducted and include availability and use of PPE appropriate to site specific hazards.

12. Designated emergency response teams with adequate training are on site. All potential emergencies have been identified. The plan is reviewed by the local fire company. Emergency plans and drills are reevaluated at least annually and after each significant incident. Appropriate alarm systems procedures for terminating an emergency are clearly defined. A special team of fire protection specialist is provided for the site. Emergency equipment availability and adequacy are reviewed and updated on an annual basis.

13. Personnel with appropriate first aid skills commensurate with likely hazards in the workplace are available. Management documents and evaluates response time on a continuing basis.

14. Personnel with certified first aid skills are always available on site; their level of training is appropriate to the hazards of the work being done. Adequacy of first aid is formally reviewed after significant incidents or following process changes.

15. Personnel trained in advanced first aid and/or emergency medical care are always available on site. A health care provider is on site for each production shift. Emergency services including provisions for ambulances, EMT's, emergency clinics, or hospital emergency rooms are provided on site.

SECTION 5 TRAINING

5.0 INTRODUCTION

Training helps ensure that employees understand the hazards to which they may be exposed and how to prevent harm to themselves and others from exposure to these hazards. Safety and health training must be documented and available for inspection by the employee, supervisor, and third party evaluators. Employee training should be tracked and employee training and training records current. Training falls primarily into two major categories: general and specific. A good example to highlight the difference is Hazard Communication (HazCom). HazCom address chemicals in the workplace and is an OSHA requirement. All workers should receive general HazCom training because we are surrounded by chemicals at work and at home. Those workers that use chemicals in their work process need the general HazCom training and job or work area specific HazCom training. The employee who uses a chemical needs to know what personal protective equipment to use, what engineering controls may be required, what the signs and symptoms are of overexposure, and what to do in the event of a spill (just to name a few). Safety training should begin with new hire or new job orientation.

5.1 Types of Training Available

5.1.1 New Hire Orientation (required for all new employees)

New employees upon arrival and prior to job assignment need to receive orientation training. This training should address the hazards associated with working at Wallops Flight Facility. Currently there is a video available for new employees that address Safety, Security, and Environmental issues at WFF. Along with the general WFF safety awareness video, new employees need to be made aware of safety issues associated with areas the employee will be assigned or will potentially encounter during the course of conducting business. New employees should review Job Hazard Analyses for tasks they will be required to perform and receive the training and PPE identified in the JHA. New employees should also be trained in Hazard Communication, emergency evacuation procedures, informed of their safety committee representative, and informed of the hazard and incident reporting process.

5.1.2 New Job or Process Orientation (Required when an employee is assigned a new job or when a process change occurs)

When a process changes or when an employees is assigned to a new job they should review the Job Hazard Analyses for that task or tasks. The employee should receive any additional training or PPE identified in the JHA. The supervisor should determine if any additional trained is required in Hazard Communication and emergency evacuation procedures.

5.1.3 Hazard Communication (HazCom) Training

As mentioned previously, HazCom is a tiered program. All employees should receive HazCom awareness training annually. This can be accomplished through training videos, computer based training, or instructor lead training. Employees who use, store, handle, or dispose of hazardous materials are required to have work site specific HazCom training. Appendix C contains a written HazCom program along with a template for creating a Work Center site specific HazCom written program. Site specific HazCom training is required annually and whenever a process change occurs such as the introduction of a new chemical.

5.1.4 Job Specific Training

OSHA and NASA have identified specific training requirements for certain jobs or tasks. For example any one who climbs above four feet is required by OSHA to have fall protection training. The JHA process is the mechanism for identifying job specific training requirements. The frequency of re-training varies and the requirements need to be investigated and scheduled accordingly. Appendix B provides a training matrix that outlines of some of the training available.

5.2 Monthly Training/Awareness

Work Centers are required to conduct monthly safety training or awareness meetings with their respective employees. The safety training/awareness can be of short duration and combined with other topics relevant to the Work Centers activities and included in all hands meetings or staff meetings. These meetings should also allow time for the Employee Safety Committee Representative to give a report on the committee's activities and field any safety related questions from other employees. Monthly meetings need to be documented and the following information recorded: Date, personnel attending (printed and signature or initials beside preprinted names), topic, and leader.

5.3 Training Records

A copy of training certificates, certification cards, or attendance logs need to be maintained in each Work Center. The safety training file needs to be maintained separately from the employee personnel files. This will facilitate third party examination of the training records to verify compliance. It is recommended that a spreadsheet be maintained for tracking purposes. The document should contain a list of employees, the training they have received, the date it was provided, and the date for retraining. This will provide a ready access to determine when training is needed and can assist with planning and budgeting. The Safety Office also maintains a Training Database for WFF personnel. The Work Center can send the Safety Office their training information for incorporation into the database. This database should be used as a backup to their own tracking system. Training received through the Safety Office such as NASA Safety Training Center courses are already included in the database.

5.4 Resources

Training can be accomplished in several ways with each having their strengths and weakness. Training can be through video, video conferencing, computer based training, web based training, and instructor lead training. Outline here are some of the resources available to the Work Center.

NASA Safety Training Center – Instructor lead onsite training, some video conferencing training. The Safety Office sends out an annual NSTC course listing to the Work Centers. Based on the response back from the Work Centers classes are requested accordingly. A list of the courses to be held for the fiscal year is available on the 803 website at: http://www.wff.nasa.gov/~code803/restricted/training.html

Safety Office Video & Power Point Library – The Safety Office has available for loan numerous videos and Power Point Presentations. Go to the following URL for a listing: http://www.wff.nasa.gov/~code803/restricted/training.html the click on Safety Training Videos.

SOLAR – Web bases training.
https://solar.msfc.nasa.gov/solar/delivery/public/html/newindex.htm

Safety Office Instructor Lead Courses – The Safety Office has prepared training courses for instruction in Office Ergonomics, Confined Space Safety, and Emergency Egress. Contact the Safety Office regarding any of these training programs or regarding the possible development of other courses.

Safety Related short topics – A good resource for short topic discussions. Go to: http://www.wff.nasa.gov/~code803/restricted/training.html then click on Safety Smart for Networks

GSFC Training and Professional Development - http://ohr.gsfc.nasa.gov/DevGuide/Home.htm

Safety Training on Line - https://safety.army.mil/pages/training/

SIGN IN SHEET

Work Center :		
Safety Topic :		
Leader :		
Print Name	**Signature**	**Date**

5.5 PEP Survey Questions

Survey questions are answered using the following Scale:
(Disagree) 1 2 3 4 5 (Agree) N/A Don't Know
Work Centers should strive to achieve 4's and 5's on all questions

EMPLOYEE QUESTIONS

1. The Information necessary for me to carry out my safety and health responsibilities is available in my work area.

2. Safety and health representatives have adequate experts to work the safety Issues In my work area.

3. Safety equipment used in my work area is supported by complete procedural documentation an appropriate training.

4. An Individual training plan has been developed for me that include the safety and health training requirements for job.

5. My employee training plan is updated to reflect changes in facilities or processes and to enhance employee safety awareness.

6. My training covers all necessary topics, operations and hazards identified for job.

7. Knowledgeable persons conduct safety and health training courses.

8. I am always notified of my retraining, makeup training, and training modification requirements.

9. If required on my job, my recertification and training requirements are documented and tracked.

10. If required, my Individual certification plan is based on job requirements defined by allocable standards worksite hazard-d identification and work lace analysis.

11. When I started work in this area, I was given a formal safety orientation to allow me to become familiar with the hazards and facility safe practices associated with mob.

12. If required, I have received instruction from persons knowledgeable of Personal Protective Equipment (PPE) and must regularly demonstrate proficiency In equipment use through drills and simulations.

13. A training program is provided for me which includes training in hazard identification, safety requirements, and safe equipment operations, if required.

14. Training in the operation of any unique equipment which I may be required to use is adequate.

15. Employees In my work area are encouraged to assist in developing training requirements.

16. Employees from my work area are encouraged to request any special training they believe they need.

17. Employees participate in establishing certification requirements on those jobs for which certification will result increased job performance/safety (Certified Crane Operator, etc…)

MANAGER/SUPERVISOR QUESTIONS

1. Orientation training is given to new hires. Safety training materials (pamphlets, posters, and videotapes) are available and used periodically at safety meetings. Safety and health training required by applicable standards is provided to all site employees. Records of training are kept, and training is evaluated to ensure that it is effective. Management established training plans have been developed for employees

2. Knowledgeable persons conduct safety and health training that is scheduled, accessed, documented, and addresses all necessary technical topics. All employees are trained to recognize hazards, violations of industry standards, and facility practices. Employees are trained to report violations to management. All site employees, including supervisors and managers, can generally demonstrate preparedness for participation in the overall safety and health program. There are easily retrievable scheduling and recordkeeping systems. Management has established training plans for their employees and track recertification requirements. Adequate safety and health hazard and professional development training is available to occupational safety and health staff members to keep up with current technology and developments.

3. Training covers all necessary topic, situations, and includes all persons working at the site (hourly employees, supervisors, managers, contractors, part-time and temporary employees) Employees participate in creating site specific training methods and materials,. Employees are trained to recognize inadequate responses to reported program violations. Retrievable record keeping system provides for appropriate retaining makeup training, and modifications to training. Management has developed training plans that include safety and health and health training for all employees. And records are completed identifying required training in each plan. The directorate has completed an annual effective training evaluation to determine if a person needs to retrain or recertify in specific areas of training. Line management understands and carries out responsibilities including analysis of work hazards, maintenance of physical protections, and reinforces employee training through performance feedback, or through enforcement. Training certification is a criterion for critical personnel placement. Adequate training resources are budgeted.

APPENDIX A

NASA FORM 1627

NASA Mishap Report

Part A: Mishap Details

MASTER FILE NO.

NOTE: FILL IN ALL KNOWN UNSHADED BLOCKS WITHIN 24 HOURS.

DETAILS

1. DATE OF INCIDENT	2. TIME OF INCIDENT	3. GENERAL LOCATION (Building, Area, Facility, etc.)	4. EXACT LOCATION (street, floor, room, etc.)

5. RESPONSIBLE ORGANIZATION	6. CONTRACT NUMBER	7. ORG. FILE NUMBER	8. ORGANIZATION POINT OF CONTACT	9. MAIL CODE	10. PHONE

11. MISSION AFFECTED, IF KNOWN	12. PROGRAM IMPACT, IF KNOWN (Describe impact in terms of delay, cost adjustment, etc.)

13. INCIDENT DESCRIPTION (Do not use actual names, include in the description the sequence of events, extent of injury or property damage, cause, etc., if known.)

IMPACT SUMMARY

14. CHECK ALL OUTCOMES FROM THIS EVENT THAT ARE KNOWN FACTS (Do not check any box that indicates any future potential or outcome.)

- ☐ FATALITY
- ☐ PERMANENT DISABILITY
- ☐ 3 OR MORE PEOPLE HOSPITALIZED
- ☐ 1 OR 2 PEOPLE HOSPITALIZED
- ☐ LOSS OF CONSCIOUSNESS
- ☐ FULL LOST WORKDAY(S)
- ☐ RESTRICTED WORKDAY(S)
- ☐ MEDICATION OR MEDICAL TREATMENT ADMINISTERED
- ☐ INJURY OR ILLNESS
- ☐ FIRST AID ONLY WAS ADMINISTERED
- ☐ SERIOUS DAMAGE TO AIRCRAFT OR SPACE HARDWARE
- ☐ SERIOUS DAMAGE TO FLIGHT OR GROUND SUPPORT HARDWARE
- ☐ UNEXPECTED DAMAGE DUE TO TEST FAILURE
- ☐ DAMAGE ESTIMATE OVER $1,000,000
- ☐ DAMAGE ESTIMATE BETWEEN $250K AND $1M
- ☐ DAMAGE ESTIMATE BETWEEN $25K AND $250K
- ☐ DAMAGE ESTIMATE BETWEEN $1K AND $25K
- ☐ DAMAGE ESTIMATE UNDER $1K
- ☐ AFFECTED PRIMARY OBJECTIVE(S) OF MISSION
- ☐ SIGNIFICANT PROGRAM IMPACT
- ☐ HIGH VISIBILITY (internal or external to NASA)

☐ CLOSE CALL

15. LEVEL OF POTENTIAL FOR THIS EVENT OR CLOSE CALL (Using reasonable judgment, check the boxes which you believe have a HIGH probability of occurring under similar conditions.)

- ☐ FATALITY
- ☐ PERMANENT DISABILITY
- ☐ 3 OR MORE PEOPLE HOSPITALIZED
- ☐ FULL LOST WORKDAY(S)
- ☐ POTENTIAL DAMAGE ESTIMATE OVER $250,000
- ☐ POTENTIAL DAMAGE ESTIMATE UNDER $250,000
- ☐ SERIOUS DAMAGE TO AIRCRAFT OR SPACE HARDWARE
- ☐ SERIOUS DAMAGE TO FLIGHT OR GROUND SUPPORT HARDWARE
- ☐ UNEXPECTED DAMAGE DUE TO TEST FAILURE
- ☐ AFFECT PRIMARY OBJECTIVE(S) OF MISSION
- ☐ SIGNIFICANT PROGRAM IMPACT
- ☐ HIGH VISIBILITY (internal or external to NASA)

PERSON INVOLVED IN INJURY OR ILLNESS

16. NAME (Last, First MI)	17. ORGANIZATION	18. CONTRACT NUMBER	19. JOB TITLE/OCCUPATION

20. SUPERVISOR'S NAME (Full Name)	21. SUPERVISOR'S ORGANIZATION	22. SUPERVISOR'S MAIL CODE	23. SUPERVISOR'S PHONE

24. AGE	25. SEX	26. SHIFT WORKED	27. CONTINUOUS DUTY HOURS	28. YEARS OF EXPERIENCE
	☐ Male ☐ Female	☐ 1st ☐ 2nd ☐ 3rd		☐ Under 1 ☐ Under 5 ☐ Under 10 ☐ Over 10

29. INJURY OR ILLNESS	30. FROM PRE-EXISTING	31. FATALITY?	32. DATE OF DEATH	33. PERMANENT DISABILITY?	34. # OF FULL LOST WORKDAYS	35. # OF RESTRICTED WORKDAYS
☐ INJURY ☐ ILLNESS	☐ YES ☐ NO	☐		☐		

36. INJURY TYPE(S) (e.g., Abrasion, Burn, Concussion, Laceration, etc.)	37. AFFECTED BODY PART(S) OR BODY SYSTEM(S)

38. BRIEF MEDICAL DIAGNOSIS

39. MEDICAL TREATMENT ADMINISTERED

- ☐ TREATMENT OF INFECTION
- ☐ APPLICATION OF ANTISEPTIC
- ☐ 2ND OR 3RD DEGREE BURN(S)
- ☐ CUT AWAY DEAD SKIN
- ☐ POSITIVE X-RAY DIAGNOSIS
- ☐ APPLICATION OF SUTURES
- ☐ USE OF BUTTERFLY ADHESIVE
- ☐ REMOVAL OF FOREIGN OBJECT(S)
- ☐ USE OF HEAT THERAPY
- ☐ ADMISSION TO HOSPITAL FOR MORE THAN OBSERVATION
- ☐ REMOVAL OF OBJECT IN WOUND
- ☐ USE OF PRESCRIPTION MEDICATION
- ☐ HOT OR COLD SOAKING/COMPRESS THERAPY
- ☐ USE OF WHIRLPOOL BATH THERAPY
- ☐ FIRST AID ONLY

40. OTHER MEDICAL TREATMENT ADMINISTERED

EQUIPMENT/PROPERTY DAMAGED

41. CLASS OF EQUIPMENT/PROPERTY DAMAGED

- ☐ FLIGHT HARDWARE
- ☐ GROUND SUPPORT EQUIPMENT
- ☐ FACILITY
- ☐ PRESSURE VESSEL
- ☐ MOTOR VEHICLE
- ☐ AIRCRAFT
- ☐ OTHER

42. ESTIMATED COST OF ALL DAMAGED ITEMS

- ☐ OVER $1,000,000
- ☐ BETWEEN $250K AND $1M
- ☐ BETWEEN $25K AND $250K
- ☐ BETWEEN $1K AND $25K
- ☐ UNDER $1,000

43. # OF ITEMS DAMAGED

45. SPECIFIC ITEM(S) DAMAGED

SUBMITTER

44. SUBMITTED BY (Full Name)	45. ORGANIZATION	46. MAIL CODE	47. PHONE	48. DATE	49. TIME

NF 1627 MAR 2001 PREVIOUS EDITIONS ARE OBSOLETE

NASA Mishap Report

Part B: Causes and Corrective Action

MASTER FILE NO.

CAUSES

50. WHAT WAS THE DIRECT CAUSE(S)	51. WHAT OBJECTS OR SUBSTANCES WERE INVOLVED	52. WHAT ACTIVITIES OR UNSAFE ACTS WERE IN PROGRESS

INITIAL CORRECTIVE ACTION

53. INITIAL ACTION TAKEN *(Summarize all corrective actions taken)*

54. DATE INITIATED	55. DATE COMPLETED	56. PERSON TAKING ACTION *(Full Name)*	57. ORGANIZATION	58. MAIL CODE	59. PHONE

PLANNED CORRECTIVE ACTION

60. PROPOSED ACTION TO BE TAKEN *(Summarize any future action to be taken.)*

61. EST. START DATE	62. EST. COMPL.	63. PERSON TAKING ACTION *(Full Name)*	64. ORGANIZATION	65. MAIL CODE	66. PHONE

67. PROPOSED ACTION TO BE TAKEN *(Summarize any future action to be taken.)*

68. EST. START DATE	69. EST. COMPL.	70. PERSON TAKING ACTION *(Full Name)*	71. ORGANIZATION	72. MAIL CODE	73. PHONE

NF 1627 MAR 2001 PREVIOUS EDITIONS ARE OBSOLETE.

Instructions

Complete the initial incident report (unshaded portions) and submit to your local NASA Safety Office within 24 hours of the incident occurrence. Complete and submit the follow-up report (with shaded areas) within ten working days of the incident. Retain a copy for your own files.

Working With This Form

This electronic document is a form. It has fields where you can enter information. You can use the mouse or TAB key to move between fields. The TAB key moves to the next field and SHIFT-TAB moves backwards. Some fields control the types of data that you can enter.
You should fill in this form electronically and send it to your local NASA Safety Office by electronic mail.

DETAILS

1. DATE OF INCIDENT - Enter date of the incident in MM/DD/YYYY format. Example: 6/1/2001.
2. TIME OF INCIDENT - Enter time of the incident using 24-hour clock. Examples: 09:30 for 9:30 AM or 14:15 for 2:15 PM.
3. GENERAL LOCATION - Identify the building, area, or facility where the incident occurred.
4. EXACT LOCATION - Describe the exact location of the incident. Example: Third floor, far west corridor.
5. RESPONSIBLE ORGANIZATION - Enter complete name of organization that is reporting the incident.
6. CONTRACT NUMBER - When the organization is a contractor, enter the contract number.
7. ORGANIZATION FILE NUMBER - Assign file number using your organization's unique four-character code, the mishap number (sequential) using four digits, and the fiscal year using two digits. Example: EGB1-0001-89.
8 - 10. ORGANIZATION POINT OF CONTACT, MAIL CODE, PHONE - Identify the person to contact at the organization.
11. MISSION AFFECTED - Enter the name or number of the mission, program, or project affected by the mishap. Examples: STS-32; Delta 181.
12. PROGRAM IMPACT - Describe the effect on the mission, program, or project in terms of delay or significant cost adjustment. Example: Two-week launch delay.
13. INCIDENT DESCRIPTION - Describe the event including information about the extent of damage and/or injury, conditions that led to the mishap, and cause if known at this time. Specify location of facility where medical treatment was provided. DO NOT include names of persons.

IMPACT SUMMARY

14. ACTUAL OUTCOMES - Mark every checkbox that represents current facts about the incident.
15. LEVEL OF POTENTIAL - Mark every checkbox that represents likely outcomes for the incident.

PERSONNEL INVOLVED IN INJURY OR ILLNESS

(If more than one person was injured, then attach a NASA Mishap Report (NF 1627) with only this section completed for each additional person.)

16. NAME - Self-explanatory.
17. ORGANIZATION - Identify the organization of the person involved.
18. CONTRACT NUMBER - When the organization is a contractor, enter the contract number.
19. JOB TITLE/OCCUPATION - Describe the job position of the person involved.
    Example: Technician
20-23. SUPERVISOR'S NAME, ORGANIZATION, MAIL CODE, & PHONE - Provide identifying information about the supervisor of the person involved.
24. AGE - (of the person involved) Self-explanatory.
25. SEX - Check as appropriate.
26. SHIFT WORKED - Check as appropriate.
27. CONTINUOUS DUTY HOURS - Self-explanatory.
28. YEARS OF EXPERIENCE - Check as appropriate.
29. INJURY OR ILLNESS - Check as appropriate.
30. FROM PRE-EXISTING - Check as appropriate.
31. FATALITY? -
32. DATE OF DEATH -
33. PERMANENT DISABILITY?
34. # OF FULL LOST WORKDAYS -
35. # OF RESTRICTED WORKDAYS -
36. INJURY TYPE(S) - Choose one or more items from the list. (See instructions below.)

37. AFFECTED BODY PART(S) or BODY SYSTEM(S) - Choose one or more items from the list. (See instructions below.)
38. BRIEF MEDICAL DIAGNOSIS -
39. MEDICAL TREATMENT ADMINISTERED - Mark every checkbox that represents treatment administered to the person involved. Mark the checkbox for "First Aid Only" if only First Aid treatment was administered to the individual.
40. MEDICAL TREATMENT ADMINISTERED - Describe any treatment not included in box #39.

EQUIPMENT/PROPERTY DAMAGE

41. CLASS OF EQUIPMENT/PROPERTY DAMAGED - Mark every checkbox that represents the type of damaged.
42. ESTIMATED COST OF ALL DAMAGED ITEMS - Mark one checkbox that represents the initially estimated cost of the damage. Provide Final Cost in follow-up report.
43. # OF ITEMS DAMAGED -
43. SPECIFIC ITEM(S) DAMAGED - Identify or describe the damaged items from box #41.
Example: If the class indicated in box #41 is Flight Hardware, then the specific item could be "Orbiter/Avionics."

SUBMITTER

44-47. SUBMITTED BY, ORGANIZATION, MAIL CODE, & PHONE - Provide identifying information about the person filling in this form.
48-49. DATE & TIME - Enter the date and time when the form is filled in.

CAUSES

50. DIRECT CAUSE(S) - Choose one or more items from the list. (See instructions below.)
51. OBJECTS OR SUBSTANCES INVOLVED - Choose one or more items from the list. (See instructions below.)
52. ACTIVITIES OR UNSAFE ACTS IN PROGRESS - Choose one or more items from the list. (See instructions below.)

INITIAL CORRECTIVE ACTION

53. INITIAL ACTION TAKEN -
54. DATE INITIATED -
55. DATE COMPLETED -
56-59. PERSON TAKING ACTION, ORGANIZATION, MAIL CODE, & PHONE - Provide identifying information about the person taking the initial corrective action.

PLANNED CORRECTIVE ACTION

60. PLANNED ACTION TO BE TAKEN -
61. ESTIMATED START DATE -
62. ESTIMATED COMPLETION -
63-66. PERSON TAKING ACTION, ORGANIZATION, MAIL CODE, & PHONE - Provide identifying information about the person taking the planned corrective action.
67. PLANNED ACTION TO BE TAKEN -
68. ESTIMATED START DATE -
69. ESTIMATED COMPLETION -
70-73. PERSON TAKING ACTION, ORGANIZATION, MAIL CODE, & PHONE - Provide identifying information about the person taking the planned corrective action.

Choosing items from a list

The list appears when you move the insertion point to this field. If the field already has data, then clicking with the mouse might not display the list again. In this case, click in an earlier field and use the TAB key to move forward and display the list.

To choose an item from the list first highlight the item you want. You can use the arrow keys or the mouse to highlight the proper item. Then either press the ENTER key, click the Ok button, or double click the item.

The list of items you have chosen is displayed at the top of the window. You can add many items to the list. To remove any item, you must edit the list with the DELETE or BACKSPACE keys. You can edit the list in the list window or you can edit the field on the form.

APPENDIX B

OSHA TRAINING MATRIX

OSHA Safety & Health

MASTER TRAINING GUIDE—29 CFR

This at-a-glance chart will help you get an overall view of your training responsibilities. The list on the following pages will give you an idea of which regulations are included in each subpart.

	1903	1904	1910 SUBPART																				1910.1200
			A	B	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Z	HCS
Who?																							
All Employees	X	X	X		X	R					R		R										R
Select Employees Only						R	R	R	R	R		R	R	X	R	R	X	R	R	R	R	R	
Supervisors	X	X			X	R		R	R	R	R				R	R		R	R	R	R	R	R
Select Employers				X	X	X			R												R		
When?																							
First Day	X	X	X			R					R												R
Before Working Without Supervision					X		R	R		R				X	R		X	R	R	R			
Upon Assignment						R	R		R	R	R	R			R	R			R	R	R	R	
Refresher						A		A	A	A	X	X	A	X		A	X	X	A	A	X	A	
Job, Process, or Equipment Changes						R	R	R	R	R	R				R		X		R		X		R
Other				X						X	X				R								
What Kind?																							
Information	X	X	X		X	R	R	R	R	R	R	R	R	X	R	R	X	R	R	R	R	R	R
Concepts								R	R	R	R	R	R			R			R	R		R	R
Skills					X	X	R	R	R	R	R	R	R	X	R	R	X	R	R	R	R	R	R
Other				X																			
What Type?																							
Work Practice					X	X	R	R	R	R	R		R	X	R	R	X	R	R	R	R	R	R
Equipment					X	X	R		R		R		R	X	R	R	X	R	R	R	R	R	R
PPE							R	R	R	R	R		R						R	R	R	R	R
Emergency						R	R	R	R	R		R	R						R		R	R	R
Right to Know	X	X	X						R		R		R						R			R	R
Recommended	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Records																							
Dates							R		R	R	R				R	R			R				
Certification							R		R	R	R				R	R			R				
Written Plan						R	R						R									R	R

R = Required X = Recommended A = Annual

Subpart A—General
Subpart B—Adoption and Extension of Established Federal Standards
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Employee Emergency Plans and Fire Prevention Plans 1910.38

Training Requirement

(i) Before implementing the emergency action plan, the employer shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

(ii) The employer shall review the plan with each employee covered by the plan at the following times:

(a) Initially when the plan is developed,

(b) Whenever the employee's responsibilities or designated actions under the plan change, and

(c) Whenever the plan is changed.

(iii) The employer shall review with each employee upon initial assignment those parts of the plan which the employee must know to protect the employee in the event of an emergency. The written plan shall be kept at the workplace and made available for employee review. For those employers with 10 or fewer employees the plan may be communicated orally to employees and the employer need not maintain a written plan.

(i) The employer shall apprise employees of the fire hazards of the materials and processes to which they are exposed.

(ii) The employer shall review with each employee upon initial assignment those parts of the fire prevention plan which the employee must know to protect the employee in the event of an emergency. The written plan shall be kept in the workplace and made available for employee review. For those employers with 10 or fewer employees, the plan may be communicated orally to employees and the employer need not maintain a written plan.

Powered Platforms for Building Maintenance—Operations Training 1910.66

(i) Working platforms shall be operated only by persons who are proficient in the operation, safe use and inspection of the particular working platform to be operated.

(ii) All employees who operate working platforms shall be trained in the following:

(A) Recognition of, and preventive measures for, the safety hazards associated with their individual work tasks.
(B) General recognition and prevention of safety hazards associated with the use of working platforms, including the provisions in the section relating to the particular working platform to be operated.
(C) Emergency action plan procedures required in paragraph **(e)(9)** of this section.
(D) Work procedures required in paragraph **(i)(1)(iv)** of this section.
(E) Personal fall arrest system inspection, care, use and system performance.

(iii) Training of employees in the operation and inspection of working platforms shall be done by a competent person.
(iv) Written work procedures for the operation, safe use and inspection of working platforms shall be provided for employee training. Pictorial methods of instruction, may be used, in lieu of written work procedures, if employee communication is improved using this method. The operating manuals supplied by manufacturers for platform system components can serve as the basis for these procedures.
(v) The employer shall certify that employees have been trained in operating and inspecting a working platform by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training and the date that training was completed. The certification record shall be prepared at the completion of the training required in paragraph **(i)(1)(ii)** of this section, and shall be maintained in a file for the duration of the employee's employment. The certification record shall be kept readily available for review by the Assistant Secretary of Labor or the Assistant Secretary's representative.
(9) Before using a personal fall arrest system, and after any component or system is changed, employees shall be trained in accordance with the requirements of paragraph **1910.66(i)(1)**, in the safe use of the system.

Dip Tanks—Personal Protection 1910.94

(9) ***Personal protection***. **(i)** All employees working in and around open surface tank operations must be instructed as to the hazards of their respective jobs, and in the personal protection and procedures applicable to these hazards.
(vi) Respirators shall be used in accordance with **§ 1910.134**, and persons who may require them shall be trained in their use.

Inspection, Maintenance and Installation 1910.94

(v) If, in emergencies, such as rescue work, it is necessary to enter a tank which may contain a hazardous atmosphere, suitable respirators, such as self contained breathing apparatus; hose mask with blower, if there is a possibility of oxygen deficiency; or a gas mask, selected and operated in accordance with paragraph **(d)(9)(vi)** of this section, shall be used. If a contaminant in the tank can cause dermatitis, or be absorbed through the skin, the employee entering the tank shall also wear protective clothing. At least one trained standby employee, with suitable respirator, shall be present in the nearest uncontaminated area. The standby employee must be able to communicate with the employee in the tank and be able to haul him out of the tank with a lifeline if necessary.

Hearing Protection 1910.95(i)(4)

(4) The employer shall provide training in the use and care of all hearing protectors provided to employees.

(1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time weighted average of 85 decibels, and shall ensure employee participation in such program.
(2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.
(3) The employer shall ensure that each employee is informed of the following:

(i) The effects of noise on hearing;
(ii) The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and care; and
(iii) The purpose of audiometric testing, and an explanation of the test procedures.

Flammable and Combustible Liquids 1910.106

(2) That detailed printed instructions of what to do in flood emergencies are properly posted.
(3) That station operators and other employees depended upon to carry out such instructions are thoroughly informed as to the location and operation of such valves and other equipment necessary to effect these requirements**.**

Explosive and Blasting Agents 1910.109

(i) Vehicles transporting explosives shall only be driven by and be in the charge of a driver who is familiar with the traffic regulations, State laws, and the provisions of this section.
(iii) Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by a driver or other attendant of the motor carrier.
This attendant shall have been made aware of the class of the explosive material in the vehicle and of its inherent dangers, and shall have been instructed in the measures and procedures to be followed in order to protect the public from those dangers.
He shall have been made familiar with the vehicle he is assigned, and shall be trained, supplied with the necessary means, and authorized to move the vehicle when required.
(iii)(a) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying, and related equipment. The employer shall assure that the operator is familiar with the commodities being delivered and the general procedure for handling emergency situations.
(ii) Vehicles transporting blasting agents shall only be driven by and be in charge of a driver in possession of a valid motor vehicle operator's license. Such a person shall also be familiar with the States vehicle and traffic laws.

Bulk Delivery and Mixing Vehicles 1910.109

(iii) The operator shall be trained in the safe operation of the vehicle together with its mixing, conveying, and related equipment. He shall be familiar with the commodities being delivered and the general procedure for handling emergency situations.

Storage and Handling of Liquefied Petroleum Gases 1910.110

(16) Instructions. Personnel performing installation, removal, operation, and maintenance work shall be properly trained in such functions.
(i) When standard watch service is provided, it shall be extended to the LP-Gas installation and personnel properly trained.
(ii) The employer shall insure that unloading operations are performed by reliable persons properly instructed and given the authority to monitor careful compliance with all applicable procedures.

Process Safety Management of Highly Hazardous Chemicals 1910.119

(g) ***Training***. **(1)** ***Initial training***. **(i)** Each employee presently involved in operating a process, and each employee before being involved in operating a newly assigned process, shall be trained in an overview of the process and in the operating procedures as specified in paragraph **(f)** of this section. The training shall include emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks.
(ii) In lieu of initial training for those employees already involved in operating a process on May 26, 1992, an employer may certify in writing that the employee has the required knowledge, skills, and abilities to safely carry out the duties and responsibilities as specified in the operating procedures.
(2) ***Refresher training***. Refresher training shall be provided at least every three years, and more often if necessary, to each employee involved in operating a process to assure that the employee understands and adheres to the current operating procedures of the process. The employer, in consultation with the employees involved in operating the process, shall determine the appropriate frequency of refresher training.
(3) ***Training documentation***. The employer shall ascertain that each employee involved in operating a process has received and understood the training required by this paragraph. The employer shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.

Contract Employer Responsibilities 1910.119

(3) ***Contract employer responsibilities***. **(i)** The contract employer shall assure that each contract employee is trained in the work practices necessary to perform his/her job.
(ii) The contract employer shall assure that each contract employee is instructed in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, and the applicable provisions of the emergency action plan.
(iii) The contract employer shall document that each contract employee has received and understood the training required by this paragraph. The contract employer shall prepare a record which contains the identity of the contract employee, the date of training, and the means used to verify that the employee understood the training.
(iv) The contract employer shall assure that each contract employee follows the safety rules of the facility including the safe work practices required by paragraph **(f)(4)** of this section.

Mechanical Integrity 1910.119

(3) ***Training for process maintenance activities***. The employer shall train each employee involved in maintaining the ongoing integrity of process equipment in an overview of that process and its hazards and in the procedures applicable to the employee's job tasks to assure that the employee can perform the job tasks in a safe manner.

Hazardous Waste Operations and Emergency Response 1910.120

(e) ***Training*** **(1)** ***General*** **(i)** All employees working on site (such as but not limited to equipment operators, general laborers and others) exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site shall receive training meeting the requirements of this paragraph before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards, and they shall receive review training as specified in this paragraph.

(ii) Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

(2) ***Elements to be covered***. The training shall thoroughly cover the following:

(i) Names of personnel and alternates responsible for site safety and health;

(ii) Safety, health and other hazards present on the site;

(iii) Use of personal protective equipment;

(iv) Work practices by which the employee can minimize risks from hazards;

(v) Safe use of engineering controls and equipment on the site;

(vi) Medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards; and

(vii) The contents of paragraphs **(G)** through **(J)** of the site safety and health plan set forth in paragraph **(b)(4)(ii)** of this section.

(3) ***Initial training***. **(i)** General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

(ii) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(iii) Workers regularly on site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible exposure limits and published exposure limits where respirators are not necessary, and the characterization indicates that there are no health hazards or the possibility of an emergency developing, shall receive a minimum of 24 hours of instruction off the site and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

(iv) Workers with 24 hours of training who are covered by paragraphs **(e)(3)(ii)** and **(e)(3)(iii)** of this section, and who become general site workers or who are required to wear respirators, shall have the additional 16 hours and two days of training necessary to total the training specified in paragraph **(e)(3)(i)(4).**

(4) ***Management and supervisor training***. Onsite management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience the training may be reduced to 24 hours and one day if the only area of their responsibility is employees covered by paragraphs **(e)(3)(ii)** and **(e)(3)(iii)** and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

(5) ***Qualifications for trainers***. Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of the applicable subject matter.

(6) ***Training certification***. Employees and supervisors that have received and successfully completed the training and field experience specified in paragraphs **(e)(1)** through **(e)(4)** of this section shall be certified by their instructor or the head instructor and trained supervisor as having successfully completed the necessary training. A written certificate shall be given to each person so certified. Any person who has not been so certified or who does not meet the requirements of paragraph **(e)(9)** of this section shall be prohibited from engaging in hazardous waste operations.
(7) ***Emergency response***. Employees who are engaged in responding to hazardous emergency situations at hazardous waste cleanup sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies.
(8) ***Refresher training***. Employees specified in paragraph **(e)(1)** of this section, and managers and supervisors specified in paragraph **(e)(4)** of this section, shall receive eight hours of refresher training annually on the items specified in paragraph **(e)(2)** and/or **(e)(4)** of this section, critiques of incidents that have occurred in the past year that can serve as training examples of any related work, and other relevant topics.
(9) ***Equivalent training***. Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to that training required in paragraphs **(e)(1**) through **(e)(4)** of this section shall not be required to provide the initial training requirements of those paragraphs to such employees. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience. However, certified employees or employees with equivalent training new to a site shall receive appropriate, site specific training before site entry and have appropriate supervised field experience at the new site. Equivalent training includes any academic training or the training that existing employees might have already received from actual hazardous waste site work experience.

Hazardous Waste Cleanup Workers 1910.120 Appendix C

2. ***Training***. The training program for employees subject to the requirements of paragraph **(e)** of this standard should address: the safety and health hazards employees should expect to find on hazardous waste clean up sites; what control measures or techniques are effective for those hazards; what monitoring procedures are effective in characterizing exposure levels; what makes an effective employer safety and health program; what a site safety and health plan should include; hands-on training with personal protective equipment and clothing they may be expected to use; the contents of the OSHA standards relevant to the employee's duties and functions; and, employee's responsibilities under OSHA and other regulations.
(i) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.

Hazardous Waste Operations—Emergency Responders 1910.120

(iii) ***Training.*** **(A)** Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn and procedures for handling emergency incidents.

Note: ***Exception #1***: An employer need not train all employees to the degree specified if the employer divided the work force in a manner such that a sufficient number of employees who have responsibility to control emergencies have the training specified, and all other employees, who may first resond to an emergency incident, have sufficient awareness training to recognize that an emergency response situation exists and that they are instructed in that case to summon the fully trained employees and not attempt control activities for which they are not trained.
Note: ***Exception #2***: An employer need not train all employees to the degree specified if arrangements have been made in advance for an outside fully trained emergency response team to respond in a reasonable period and all employees, who may come to the incident first, have sufficient awareness training to recognize that an emergency response situation exists and they have been instructed to call the designated outside, fully trained emergency response team for assistance.
(B) Employee members of TSD facility emergency response organizations shall be trained to a level of competence in the recognition of health and safety hazards to protect themselves and other employees. This would include training in the methods used to minimize the risk from safety and health hazards; in the safe use of control equipment; in the selection and use of appropriate personal protective equipment; in the safe operating procedures to be used at the incident scene; in the techniques of coordination with other employees to minimize risks; in the appropriate response to overexposure from health hazards or injury to themselves and other employees; and in the recognition of subsequent symptoms which may result from overexposures.
(C) The employer shall certify that each covered employee has attended and successfully completed the training required in paragraph **(p)(8)(iii)** of this section, or shall certify the employee's competency at least yearly. The method used to demonstrate competency for certification of training shall be recorded and maintained by the employer.
(i) ***New employees***. The employer shall develop and implement a training program, which is part of the employer's safety and health program, for employees exposed to health hazards or hazardous substances at TSD operations to enable the employees to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually. Employees who have received the initial training required by this paragraph shall be given a written certificate attesting that they have successfully completed the necessary training.
(ii) ***Current employees***. Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by this paragraph, shall be considered as meeting the initial training requirements of this paragraph as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Current employees shall receive eight hours of refresher training annually.
(iii) ***Trainers.*** Trainers who teach initial training shall have satisfactorily completed a training course for teaching the subjects they are expected to teach or they shall have the academic credentials and instruction experience necessary to demonstrate a good command of the subject matter of the courses and competent instructional skills.
(iii) ***Training***. **(A)** Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn, and procedures for handling emergency incidents.
(4) ***Skilled support personnel***. Personnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own

employees, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the training required in this paragraph for the employer's regular employees. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.

(5) ***Specialist employees.*** Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident to the individual in charge, shall receive training or demonstrate competency in the area of their specialization annually.

(6) ***Training***. Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate in emergency response, shall be given training in accordance with the following paragraphs:

(i) ***First responder awareness level*.** First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

(A) An understanding of what hazardous substances are, and the risks associated with them in an incident.

(B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.

(C) The ability to recognize the presence of hazardous substances in an emergency.

(D) The ability to identify the hazardous substances, if possible.

(E) An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.

(F) The ability to realize the need for additional resources, and to make appropriate notifications to the communications center.

(ii) ***First responder operations level***. First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:

(A) Knowledge of the basic hazard and risk assessment techniques.

(B) Know how to select and use proper personal protective equipment provided to the first responder operational level

(C) An understanding of basic hazardous materials terms.

(D) Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.

(E) Know how to implement basic decontamination procedures.

(F) An understanding of the relevant standard operating procedures and termination procedures.

(iii) ***Hazardous materials technician***. Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance. Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

(A) Know how to implement the employer's emergency response plan.

(C) Be able to function within an assigned role in the Incident Command System

(D) Know how to select and use proper specialized chemical personal protective equipment provided to the hazardous materials technician.

(E) Understand hazard and risk assessment techniques.

(F) Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit.

(G) Understand and implement decontamination.

(H) Understand termination procedures.

(I) Understand basic chemical and toxicological terminology and behavior

(iv) ***Hazardous materials specialist***. Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local and other government authorities in regards to site activities. Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

(A) Know how to implement the local emergency response plan.

(B) Understand classification, identification and verification of known and unknown materials by using advanced survey instruments and equipment.

(C) Know of the state emergency response plan.

(D) Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.

(E) Understand in-depth hazard and risk techniques.

(F) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.

(G) Be able to determine and implement decontamination procedures.

(H) Have the ability to develop a site safety and control plan.

(I) Understand chemical, radiological and toxicological terminology and behavior.

(v) ***On scene incident commander***. Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

(A) Know and be able to implement the employer's incident command system.

(B) Know how to implement the employer's emergency response plan.

(C) Know and understand the hazards and risks associated with employees working in chemical protective clothing.

(D) Know how to implement the local emergency response plan.

(E) Know of the state emergency response plan and of the Federal Regional Response Team.

(F) Know and understand the importance of decontamination procedures.

(7) ***Trainers.*** Trainers who teach any of the above training subjects shall have satisfactorily completed a training course for teaching the subjects they are expected to teach, such as the courses offered by the U.S. National Fire Academy, or they shall have the training and/or academic credentials and instructional experience necessary to demonstrate competent instructional skills and a good command of the subject matter of the courses they are to teach.

Personal Protective Equipment 1910.132

(f) ***Training***. **(1)** The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following:

(i) When PPE is necessary;

(ii) What PPE is necessary;

(iii) How to properly don, doff, adjust and wear PPE;

(iv) The limitations of the PPE; and,

(v) The proper care, maintenance, useful life, and disposal of the PPE.

(2) Each affected employee shall demonstrate an understanding of the training specified in paragraph **(f)(1)** of this section and the ability to use PPE properly before being allowed to perform work requiring the use of PPE.

(3) When the employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by paragraph **(f)(2)** of this section, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

(i) Changes in the workplace render previous training obsolete, or

(ii) Changes in the types of PPE to be used render previous training obsolete; or

(iii) Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

(4) The employer shall verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

Respiratory Protection 1910.134

(k) ***Training and information.*** **(1)** The employer shall ensure that each employee can demonstrate knowledge of at least the following:

(i) Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;

(ii) What the limitations and capabilities of the respirator are;

(iii) How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;

(iv) How to inspect, put on and remove, use, and check the seals of the respirator;

(v) What the procedures are for maintenance and storage of the respirator;

(vi) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and

vii) The general requirements of this section.

(2) Training shall be conducted in a manner that is understandable to the employee.

(3) The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.
(5) Retraining shall be administered annually and when the following situations occur:

(i) Changes in the workplace or the type of respirator render previous training obsolete;
ii) Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill; or
(iii) Any other situation arises in which retraining appears necessary to ensure safe respirator use.

(3) The employee shall use the provided respiratory protection in accordance with instructions and training received.
(3) The user shall be instructed and trained in the proper use of respirators and their limitations.
(2) the correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued. Each respirator permanently assigned to an individual should be durably marked to indicate to whom it was assigned. This mark shall not affect the respirator performance in any way. The date of issuance should be recorded.
(3) Written procedures shall be prepared covering safe use of respirators in dangerous atmospheres that might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.
(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.
(5) For safe use of any respirator, it is essential that the user be properly instructed in its selection, use, and maintenance. Both supervisors and workers shall be so instructed by competent persons. Training shall provide the men an opportunity to handle the respirator, have it fitted properly, test its face-piece-to face seal, wear it in normal air for a long familiarity period, and, finally, to wear it in a test atmosphere.
(i) Every respirator wearer shall receive fitting instructions including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the facepiece, or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of a facepiece. The worker's diligence in observing these factors shall be evaluated by periodic check. To assure proper protection, the facepiece fit shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer's facepiece fitting instructions.

Specifications for Accident Prevention Signs and Tags 1910.145

(1)(ii) All employees shall be instructed that danger signs indicate immediate danger and that special precautions are necessary.
(2)(ii) All employees shall be instructed that caution signs indicate a possible hazard against which proper precautions should be taken.
(3) ***Safety instruction signs***. Safety instruction signs shall be used where there is a need for general instructions and suggestions relative to safety measures.

Permit Required Confined Spaces 1910.146

(g) ***Training*** **(1)** The employer shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
(2) Training shall be provided to each affected employee:

(i) Before the employee is first assigned duties under this section;
(ii) Before there is a change in assigned duties;
(iii) Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;
(iv) Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by paragraph **(d)(3)** of this section or that there are inadequacies in the employees' knowledge or use of these procedures.

(3) The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.
(4) The employer shall certify that the training required by paragraphs **(g)(1)** through **(g)(3)** of this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorize representatives.
(k) ***Rescue and Emergency Services***. **(1)** The following requirements apply to employers who have employees enter permit required confined spaces to perform rescue services.
(i) The employer shall ensure that each member of the rescue service is provided with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from permit required confined spaces.
(ii) Each member of the rescue service shall be trained to perform the assigned rescue duties. Each member of the rescue service shall also receive the training required of authorized entrants under paragraph **(g)** of this section.
(iii) Each member of the rescue service shall practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, mannequins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.
(iv) Each member of the rescue service shall be trained in basic first-aid and in cardiopulmonary resuscitation (CPR). At least one member of the rescue service holding current certification in first-aid and in CPR shall be available.

The Control of Hazardous Energy (lockout/tagout) 1910.147

(ii) When other standards in this part require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this section.
(4) ***Energy control procedure***. **(i)** Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.
(D) Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth in paragraph **(c)(7)(ii)** of this section.
(7) ***Training and communication***. **(i)** The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and

skills required for the safe application, usage, and removal of energy controls are required by employees. The training shall include the following:

(A) Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

(B) Each affected employee shall be instructed in the purpose and use of the energy control procedure.

(C) All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

(ii) When tagout systems are used, employees shall also be trained in the following limitations of tags:

(A) Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

(B) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person for it, and it is never to be bypassed, ignored, or otherwise defeated.

(C) Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.

(D) Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

(E) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(F) Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

(iii) ***Employee retraining***. **(A)** Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

(B) Additional retraining shall also be conducted whenever a periodic inspection under paragraph **(c)(6)** of this section reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in the knowledge or use of the energy control procedures.

(C) The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

(iv) The employer shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

(8) ***Energy isolation***. Implementation of lockout or the tagout system shall be performed only by authorized employees.

Lockout or Tagout Devices Removed 1910.147

(3) ***Lockout or tagout devices removal***. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. ***Exception to paragraph (e)(3)***: When the authorized employee who applied the lock-out or tagout device is not available to remove it, that device may be removed under the direction of the employer, provided that specific procedures and training for such removal have been developed, documented and incorporated into the employer's

energy control program. The employer shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it.
(i) The on-site employer shall ensure that his/her personnel understand and comply with restrictions and prohibitions of the outside employer's energy control procedures.

Medical Services and First-Aid 1910.151

(a) The employer shall ensure the ready availability of personnel for advice and consultation on matters of plant health.
(b) In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first-aid. First-aid supplies approved by the consulting physician shall be readily available.

Fire Protection 1910.155

(41) "Training" means the process of making proficient through instruction and hands-on practice in the operation of equipment, including respiratory protection equipment, that is expected to be used and in the performance of assigned duties.
(b) ***Organization*****—(1)** ***Organizational statement****.* The employer shall prepare and maintain a statement or written policy which establishes the existence of a fire brigade; the basic organizational structure; the type, amount, and frequency of training to be provided to fire brigade members; the expected number of members in the fire brigade; and the functions that the fire brigade is to perform at the workplace. The organizational statement shall be available for inspection by the Assistant Secretary and by employees or their designated representatives.
(c) ***Training and education***. **(1)** The employer shall provide training and education for all fire brigade members commensurate with those duties and functions that fire brigade members are expected to perform. Such training and education shall be provided to fire brigade members before they perform fire brigade emergency activities. Fire brigade leaders and training instructors shall be provided with training and education which is more comprehensive than that provided to the general membership of the fire brigade.
(2) The employer shall assure that training and education is conducted frequently enough to assure that each member of the fire brigade is able to perform the member's assigned duties and functions satisfactorily and in a safe manner so as not to endanger fire brigade members or other employees. All fire brigade members shall be provided with training at least annually. In addition, fire brigade members who are expected to perform interior structural firefighting shall be provided with an education session or training at least quarterly.
(3) The quality of the training and education program for fire brigade members shall be similar to those conducted by such fire training schools as the Maryland Fire and Rescue Institute; Iowa Fire Service Extension; West Virginia Fire Service Extension; Georgia Fire Academy; New York State Department, Fire Prevention and Control; Louisiana State University Firemen Training Program; or Washington State's Fire Service, Training Commission for Vocational Education. (for example, for the oil refinery industry, with its unique hazards, the training and education program for those fire brigade members shall be similar to those conducted by Texas A & M University, Lamar University, Reno Fire School, or the Delaware State Fire School).
(4) The employer shall inform fire brigade members about special hazards such as storage and use of flammable liquids and gases, toxic chemicals, radioactive sources, and water reactive substances, to which they may be exposed during fire and other emergencies. The fire brigade members shall also be advised of any changes that occur in relation to the special hazards. The employer shall develop and make available for inspection by fire brigade members, written procedures that describe the actions to

be taken in situations involving the special hazards and shall include these in the training and education program.

Portable fire Extinguishers 1910.157

(g) ***Training and education***. **(1)** Where the employer has provided portable fire extinguishers for employee use in the workplace, the employer shall also provide an educational program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage firefighting.
(2) The employer shall provide the education required in paragraph **(g)(1)** of this section upon initial employment and at least annually thereafter.
(4) The employer shall provide the training required in paragraph **(g)(3)** of this section upon initial assignment to the designated group of employees and at least annually thereafter.
(vi) The employer shall designate trained persons to conduct all inspections required under this section.

Fixed Extinguishing Systems 1910.160

(10) The employer shall train employees designated to inspect, maintain, operate, or repair fixed extinguishing systems and annually review their training to keep them up-to-date in the functions they are to perform.

Fire Detection Systems 1910.164

(4) The employer shall assure that the servicing, maintenance and testing of fire detection systems, including cleaning and necessary sensitivity adjustments, are performed by a trained person knowledgeable in the operations and functions of the system.

Employee Alarm Systems 1910.165

(d) ***Maintenance and testing*****. (5)** The employer shall assure that the servicing, maintenance, and testing of employee alarms are done by persons trained in the designed operation and functions necessary for reliable and safe operation of the system.

Powered Industrial Trucks 1910.178

(l) ***Operator training***. Only trained and authorized operators shall be permitted to operate a powered industrial truck. Methods shall be devised to train operators in the safe operation of powered industrial trucks.

Moving the Load 1910.179

(ix) When two or more cranes are used to lift a load, one qualified responsible person shall be in charge of the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.
(3) ***Fire extinguishers***. The employer shall insure that operators are familiar with the operation and care of fire extinguishers provided.

Crawler Locomotives and Truck Cranes 1910.180

(ii) Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.

Mechanical Power Presses 1910.217

(3) ***Training of maintenance personnel***. It shall be the responsibility of the employer to insure the original and continuing competence of personnel caring for, inspecting, and maintaining power presses.
(2) ***Instruction to operators*.** The employer shall train and instruct the operator in the safe method of work before starting work on any operation covered by this section. The employer shall insure by adequate supervision that correct operating procedures are being followed.
(2) ***Instruction to operators*.** The employer shall train and instruct the operator in the safe method of work before starting work on any operation covered by this section. The employer shall insure by adequate supervision that correct operating procedures are being followed.

Training of Maintenance personnel 1910.217

(3) ***Training of Maintenance personnel.*** It shall be responsibility of the employer to insure the original and continuing competence of personnel caring for, inspecting, and maintaining power presses.

Operator Training 1910.217

(i) The operator training required by paragraph **(f)(2)** of this section shall be provided to the employee before the employee initially operates the press and as needed to maintain competence, but not less than annually thereafter. It shall include instruction relative to the following items for presses used in the PSDI mode:

> **(A)** The manufacturer's recommended test procedures for checking operation of the presence sensing device. This shall include the use of the test rod required by paragraph **(h)(10)(i)** of this section.
> **(B)** The safety distance required.
> **(C)** The operation, function and performance of the PSDI mode.
> **(D)** The requirements for hand tools that may be used in the PSDI mode.
> **(E)** The severe consequences that can result if he or she attempts to circumvent or bypass any of the safeguard or operating functions of the PSDI system.

(ii) The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person or the person who conducted the training, and the date the training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health.

Forging Machines 1910.218

(2) ***Inspection and maintenance***. It shall be the responsibility of the employer to maintain all forge shop equipment in a condition which will ensure continued safe operation. This responsibility includes:
(iii) Training personnel for the proper inspection and maintenance of forging machinery and equipment.

Welding, Cutting, and Brazing—General Requirements 1910.252

(xiii) ***Management*.** Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and:
(C) Insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process.

Oxygen—Fuel Gas Welding and Cutting 1910.253

(4) ***Personnel***. Workmen in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be instructed by their employers for this important work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be readily available.

Arc Welding and Cutting 1910.254

(3) ***Instruction***. Workmen designated to operate arc welding equipment shall have been properly instructed and qualified to operate such equipment as specified in paragraph **(d)** of this section.

Resistance Welding 1910.255

(3) ***Personnel***. Workmen designated to operate resistance welding equipment shall have been properly instructed and judged competent to operate such equipment.

Telecommunications 1910.268

(i) Employees assigned to work with storage batteries shall be instructed in emergency procedures such as dealing with accidental acid spills.

(c) ***Training***. Employers shall provide training in the various precautions and safe practices described in this section and shall insure that employees do not engage in the activities to which this section applies until such employees have received proper training in the various precautions and safe practices required by this section. However, where the employer can demonstrate that an employee is already trained in the precautions and safe practices required by this section prior to his employment, training need not be provided to that employee in accordance with this section. Where training is required, it shall consist of on-the-job training or classroom-type training or a combination of both. The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health. Such training shall, where appropriate, include the following subjects:

(1) Recognition and avoidance of dangers relating to encounters with harmful substances and animal, insect, or plant life;

(2) Procedures to be followed in emergency situations; and,

(3) First-aid training, including instruction in artificial respiration.

(D) Only persons trained in the operation of the derrick shall be permitted to operate the derrick

(l) ***Cable fault locating and testing***. **(1)** Employees involved in using high voltages to locate trouble or test cables shall be instructed in the precautions necessary for their own safety and the safety of other employees.

(ii) While work is being performed in the manhole, a person with basic first aid training shall be immediately available to render assistance if there is cause for believing that a safety hazard exists, and if the requirements contained in paragraphs **(d)(1)** and **(o)(1)(i)** of this section do not adequately protect the employee(s).

(3) ***Joint power and telecommunication manholes***. While work is being performed in a manhole occupied jointly by an electric utility and a telecommunication utility, an employee with basic first-aid training shall be available in the immediate vicinity to render emergency assistance as may be required. The employee whose presence is required in the immediate vicinity for the purposes of rendering emergency assistance is not to be precluded from occasionally entering a manhole to provide

assistance other than in an emergency. The requirement of this paragraph **(o)(3)** does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work if such work can be performed safely.

(ii) Employees engaged in line clearing operations shall be instructed that:

(A) A direct contact is made when any part of the body touches or contacts an energized conductor, or other energized electrical fixture or apparatus.

(B) An indirect contact is made when any part of the body touches any object in contact with an energized electrical conductor, or other energized fixture or apparatus.

(C) An indirect contact can be made through conductive tools, tree branches, trucks, equipment, or other objects, or as a result of communications wires, cables, fences, or guy wires being accidentally energized.

(D) Electric shock will occur when an employee, by either direct or indirect contact with an energized conductor, energized tree limb, tool, equipment, or other object, provides a path for the flow of electricity to a grounded object or to the ground itself. Simultaneous contact with two energized conductors will also cause electric shock which may result in serious or fatal injury.

(ii) Only qualified employees or trainees, familiar with the special techniques and hazards involved in line clearance, shall be permitted to perform the work if it is found that an electrical hazard exists.

(iii) During all tree working operations aloft where an electrical hazard of more than 750V exists, there shall be a second employee or trainee qualified in line clearance tree trimming within normal voice communication.

Special training is required if employees working with the following chemicals:

Asbestos	**4-Dimethylaminoazobenzene**
4-Nitrobiphenyl	**N-Nitrosodimethylamine**
Alpha-Napthylamine	**Vinyl Chloride**
Methyl Chloromethyl	**Inorganic Arsenic**
Ether	**Cadmium**
3,3'-Dichlorobenzidine (and its salts)	**Lead**
Bis-Chloromethyl Ether	**Benzene**
Beta-Naphthylamine	**Cotton Dust**
Benzidine	**1,2-Dibromo-3-Chloropropane**
4-Aminodiphenyl	**Acrylonitrile (Vinyl Cyanide)**
Ethyleneimine	**Ethylene Oxide**
Beta-Propiolactone	**4,4' Methylenedianiline**
2-Acetylaminofluorene	**Formaldehyde**

Bloodborne Pathogens 1910.1030

(2) ***Information and Training***. **(i)** Employers shall ensure that all employees with occupational exposure participate in a training program which must be provided at no cost to the employee and during working hours.

(ii) Training shall be provided as follows:

(A) At the time of initial assignment to tasks where occupational exposure may take place;

(B) Within 90 days after the effective date of the standard; and

(C) At least annually thereafter.

(iii) For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard which were not included need be provided.

(iv) Annual training for all employees shall be provided within one year of their previous training.

(v) Employers shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

Ionizing Radiation Testing 1910.1096

(viii) Before placing the system into operation, all employees normally working in the area shall be made acquainted with the signal by actual demonstration at their work locations.

(i)(2) All individuals working in or frequenting any portion of a radiation area shall be informed of the occurrence of radioactive materials or of radiation in such portions of the radiation area; shall be instructed in the safety problems associated with exposure to such materials or radiation and in precautions or devices to minimize exposure; shall be instructed in the applicable provisions of this section for the protection of employees from exposure to radiation or radioactive materials; and shall be advised of reports of radiation exposure which employees must request pursuant to the regulations in this section.

Hazard Communication 1910.1200

(h) ***Employee Information and Training.*** **(1)** Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.

(2) ***Information.*** Employees shall be informed of:

(i) The requirements of this section;

(ii) Any operations in their work area where hazardous chemicals are present; and,

(iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

(3) ***Training.*** Employee training shall include at least:

(i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

(ii) The physical and health hazards of the chemicals in the work area;

(iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

(iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

(f) ***Employee information and training***. **(1)** The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area.

APPENDIX C

HAZARD COMMUNICATION PLAN
WITH
SITE SPECIFIC TEMPLATE

HAZARD COMMUNICATION PROGRAM

WORK AREA IMPLEMENTATION

A. PURPOSE AND SCOPE:

This document establishes procedures for implemented a Hazard Communication Program to inform employees in the _____ of chemical hazards they may be exposed to in the workplace under normal conditions, or in a foreseeable emergency. Under this program employees will be informed of the contents of your work, safe handling procedures, and measures to protect yourselves from these chemicals. The written program is available in the following location: _____

B. APPLICABILITY:

The Hazard Communication Program is applicable to all civil servants working in the _____.

C. POLICY:

It is the policy of WFF to establish and implement a comprehensive Hazard Communication Program which fully meets the requirements of 29 CFR 1910.1200, the Hazard Communication Standard, promulgated by the Occupational Safety and Health Administration (OSHA).

D. RESPONSIBILITIES:

a. The Director of Code _____ has overall responsibility for ensuring that the Hazard Communication Program is implemented in the _____ Office. Additionally, the

b. The Director of Code _____ shall:

(1) Ensure that necessary resources needed to comply with the Hazard Communication Program are available;

(2) Ensure that AET Directorate Office staff attend required training; and,

(3) Ensure that new employees are appropriately trained to an awareness level.

c. The Occupational Safety Office or its designated representative has overall responsibility for monitoring this program. Specific responsibilities include but are not limited to the following:

(1) Assist managers in determining the level and content of training required by each organization to adequately inform employees of the hazards of workplace chemicals to fully comply with the Hazard Communication Program;

(2) Audit various WFF organizations to ensure that employees are trained in accordance with the Hazard Communication Program;

(3) Provide technical support to WFF organizations including but not limited to hazard analyses of the workplace, safety inspections and audits,

observations and reviews of work practices, procedures, personal protective equipment, and procurements.

d. Line Supervisors have the responsibility for direct action and enforcement to ensure compliance with the Hazard Communication Program. Line supervisors shall:

(1) Maintain copies of MSDS's, which are readily accessible to employees on all work shifts, for each hazardous chemical in the workplace;
(2) Maintain an accurate inventory of the hazardous chemicals used in the work area. Provide an updated inventory list to higher management prior to the beginning of each calendar year;
(3) Ensure that the containers of hazardous chemicals in the work area are appropriately labeled. Containers without appropriate labels shall be sent back to the supplier unless the contents of the container are definitely known. Where contents are known, the container shall be immediately labeled with the appropriate information
(4) Attend required hazard communication training. The level of training required will be determined by the extent with which chemical handling by the supervisor or his/her employees occur. Supervisors whose employees routinely handle chemicals are also required to attend **Hazard Communication** training;
(5) Ensure that employees under their supervision attend required Hazard Communication training sessions;
(6) Train employees on the specific hazards of the chemicals used in the work area. Training shall be conducted at the time of an employees' initial assignment, an employee's change in assignment, and whenever a new chemical, which represents a new hazard, is introduced into the work area;
(7) Ensure that the personnel not normally assigned to the work area, such as maintenance and contractor personnel, are informed of the hazards of the chemicals to which they may be exposed while present at the job site;
(8) Enforce safety practices such as using appropriate personal protective equipment (PPE); implement safety precautions and procedures for operations which involve the use of hazardous chemicals; utilize the MSDS's as references; and enforce GSFC smoking policies; and
(9) Develop operating procedures for each of the routine tasks and known non-routine tasks involving hazardous materials. Ensure that workers review these procedures prior to performing these tasks.

e. All Employees shall:

(1) Read the MSDS's and labels to become familiar with the safety precautions, chemical and physical properties, and potential health hazards of the chemicals to include sign and symptoms of over exposure, prior to handling the chemicals;
(2) Exercise all necessary precautions in the safe use of hazardous chemicals, including wearing personal protective equipment as specified on the MSDS or recommended by the Safety Office;

(3) Notify the supervisor of any apparent deficiencies involving hazard communication, such as missing MSDS's, improperly labeled containers of hazardous chemicals, chemicals not listed on the hazardous chemical inventory for the work area, etc.;
(4) Participate in scheduled training sessions for hazard communication;
(5) Report all working conditions which may cause substantial personal exposure to hazardous chemicals to a supervisor; and
(6) Review operating procedures prior to performing tasks involving hazardous materials.

E. EMPLOYEE TRAINING:

Supervisors shall oversee the training of employees on the specific hazards of the chemicals used in the work area. Training shall be conducted at the time of an employees' initial assignment, an employee's change in assignment, and whenever a new chemical, which represents a new hazard, is introduced into the work area.

(Person/Position) will verify that all containers received and used in the work area are clearly labeled to identify the contents and the appropriate hazard warnings. Existing labels on incoming containers of hazardous chemicals will not be removed or defaced unless the container is immediately marked with the required information. All employees who transfer hazardous chemicals into portable containers will ensure the containers are appropriately labeled and the contents identified.

Labels will include at least the following information:

(1) Warning statement, message, or symbol
(2) Product name
(3) Manufacturer's name and address

Employees shall be informed of the methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.)

Insert a section on the detection of release. Include chemical(s) and method of detection. [Example: nitrogen displaces oxygen in the air, detection method oxygen sensors are used to detect displacement of oxygen by nitrogen which indicates a nitrogen release to the atmosphere]

Physical (fire, explosion, etc.) and health hazards associated with the chemicals in the work area. The employee will become familiar with the chemicals in their work area by examining the MSDS for these chemicals they will use or come in contact with. Employees who require emergency medical treatment after exposure to a chemical should take a copy of the MSDS to the medical facility.

Show the employee where MSDS sheets are stored and how to use them. Make sure they understand which chemicals they will be using or will come in contact and safety precautions, chemical and physical properties, and potential physical and health hazards of the chemicals to include sign and symptoms of over exposure and conditions to avoid (i.e. do not mix with water)

The measures employees can take to protect themselves from these hazards including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures.

Provide the employee with any written procedures they should be aware of. Inform the employee of emergency procedures including, clean up of small spills, contacting emergency personnel, and building evacuation procedure. Procedures should include engineering controls to be used such as lab hoods or local exhaust ventilation.

Include an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

If your organization takes chemicals out of their original container and places it in a secondary container inform the employee of the labeling system used on the secondary container to identify the product.

If work activities are performed by employees in areas where chemicals are transferred through unlabeled pipes the employee shall be informed of the contents of these lines prior to starting work in these areas.

Employees must be informed of the proper personal protective equipment (PPE) required for their work to include when it is required, how to use the PPE, and how to maintain and store it.

The following table can be used as a guide

Example process

Process and Location	Chemicals Involved	Location of MSDS	PPE Required	Spill or Leak Detection Method
Liquid nitrogen transfer in room 112	Liquid nitrogen	Room 112 north wall	-Thermal Protective Gloves -Face Shield -Splash Apron	Oxygen Sensor

APPENDIX D

JOB HAZARD ANALYSIS FORMS

Certification of Hazard Assessment
For

_____

(operation or task)

Certified by _____

(supervisor)

LOG OF REVIEWS & REVISIONS

Review/Revision	Signature	Date

Cover Sheet for JHA

Page ____ of ____

JOB HAZARD ANALYSIS

Job/Task: **Date:**

Analyst: **Location:**

Employee(s):

No.	Job Steps	Potential Hazards	Recommended Controls

APPENDIX E

SAMPLE EMERGENCY EVACUATION PLAN

TABLE OF CONTENTS

Building Warden
Everett King, Rm.126 Code:227.4 Ext. 6-5523

Floor Warden's
Ed Powell, Rm. 140a. Code: 227.6 Ext.6-2017

Ron Rector, Rm. 183c. Code:545 Ext. 6-4365

James Gorham, Rm.175g. Code: 227.5 Ext.6-1401

Ed Weaver, Rm. 147 Code: 227.5 Ext. 6-1341

Introduction. This document describes the actions and responses required during emergencies affecting the Goddard Space Flight Center (GSFC) and Building [*04*] All occupants and frequent visitors of this building must be familiar with these procedures to ensure protection of personnel and property.

1. Emergency Notification Systems:

GSFC has developed several methods for communicating emergency information. Emergencies may be very localized, such as an injured person, or Center-wide. Report all emergencies by calling 911.

1.1 Alarm Systems

1.1.1 Evacuation Alarms

Buildings at GSFC are equipped with evacuation alarms. These alarms will sound as a rhythmic 'gonging' alert, a pulsing horn, or loud "clanging" bells, each system augmented by a bright strobe light for the hearing impaired. Evacuation alarms are activated when a flow is detected in the sprinkler system, a manual pull station is activated, or remotely by the Emergency Console.

ANY EVACUATION ALARM ACTIVATION LASTING MORE THAN 30 SECONDS SHALL BE CONSIDERED A VALID ALARM, AND THE BUILDING MUST BE EVACUATED.

1.1.2 Local Hazard Alarm

Many areas at GSFC are equipped with local hazard alarms. These alarms will typically sound as a continuous loud buzzer. A local hazard alarm indicates that an unsafe condition is developing and needs to be investigated by persons familiar with the area and operations. Local hazard alarms are usually activated by smoke detectors but may also be associated with chemical detection systems and special processing equipment.

1.2 Other Emergency Notification Systems

1.2.1 Management Notification Process – Notification and direction for special situations are provided via telephone through the Center management structure.

1.2.2 Email Notification – Notification and direction for special situations is provided via e-mail 'blaster.' Email notification is often used in conjunction with the management notification process.

1.2.3 Verbal Notification – Notification is accomplished through the Building Wardens, safety and security personnel. Verbal notification is typically used when very specific actions are required in a limited area (a single building or part of a building).

2. Types of Emergency Situations: ***What types of emergencies might occur at GSFC?***

2.1 Fire, Visible Smoke, Sprinkler Activation, or Explosion

There are many potential sources of fire, smoke or explosions. GSFC has incorporated a number of safeguards against injury of our people into the design and maintenance of our buildings. These include fire sprinkler systems, automatic building evacuation alarms, manually operated evacuation alarms, smoke detectors in special hazard areas, and fire walls. These safeguards limit the ability of fires to spread throughout a building.

2.2 Medical Emergency

Medical emergencies encompass any injury or illness requiring a response.

2.3 Indoor Chemical Spill

GSFC uses a variety of chemicals and hazardous materials in accomplishing our mission. Safeguards are incorporated into buildings and operations to minimize the potential and severity of an accident. Safeguards include minimizing the quantities of chemicals stored, special storage cabinets, safe handling procedures, and training for users.

2.4 Suspicious Package (possible explosive device or contaminated package/letter)

GSFC's secure perimeter makes it a difficult target for the placement of explosives. However, packages are discovered onsite periodically that cannot be accounted for (the owner is not known).

2.5 Threat of an Explosive Device

Threats are generally received by telephone, but may also be received in writing, e-mails or even face-to-face.

2.6 Outdoor Atmospheric Hazard (e.g., Chemical Vapor Cloud)

Outdoor atmospheric hazards can occur from accidental causes or can be intentionally created. The most common causes are accidental releases which may come from a GSFC operation (liquid nitrogen tank) or from offsite (overturned tanker).

2.7 Weather-Related Emergencies

High winds, severe thunderstorms, tornadoes, and snowstorms all create the potential for an emergency situation.

2.8 Other Emergencies

Emergencies not specifically defined above need to be considered when planning and defining emergency actions. *Bldg.4 Rm 175g flammable material storage room.*

3. Occupant Response Procedures:

3.1 Evacuation Routes and Assembly Areas

Diagrams showing evacuation routes, primary assembly areas, and alternate assembly areas are shown in Attachment 1 of this document.

3.2 Fire, Visible Smoke, Sprinkler Activation, or Explosion

3.2.1. If the building evacuation alarm sounds or you are told by management or Floor Wardens to evacuate, do so immediately.

- Avoid areas of obvious hazard.
- Know your alternate exit routes.
- Secure critical operations, hazardous materials and classified information.
- Close office doors.
- Report to your assembly area as shown in Attachment 1.
- Provide your management and Warden with information on coworkers that were not in the building at the time of the emergency.
- Remain in the assembly area until released.
- Do not reenter the building until the on-scene Incident Commander (see 4.4) authorizes reentry.

3.2.2 If you witness a Fire, Visible Smoke, Sprinkler Activation, or Explosion –

- Notify other persons in the area.
- Initiate an evacuation of the building.
- If you have received training in the use of fire extinguishers within the past year, attempt to extinguish small, incipient fires.
- Report information to your building warden and the Incident Commander.

3.2.3 If you witness a fire that has been extinguished –

- If there is visible smoke, leave the area and initiate a building evacuation.
- Immediately call 911 and relay all related information

3.2.4. Critical Operations-N/A

3.2.5. Special Operations N/A

3.3 Medical Emergency

If there is an medical emergency in your area:

- Call 911 for emergency medical assistance.
- Verify that any hazards are controlled or isolated to prevent further injury.
- Provide assistance and information to responders, and
- Once information has been provided, stay clear of the immediate area.

3.4 Indoor Chemical Spill

3.4.1 If an indoor spill occurs:

- Users are authorized to clean up spilled materials when the cleanup can be accomplished within the limits of their personal protective equipment and training. (Chemical users are able to make this determination if they have received specific hazard training on the chemicals they use and the available personal protective equipment.)
- The affected areas of the spill shall be cleared of personnel and isolated from access.
- The spill shall be immediately reported to 911 with all relative information including materials involved, amount spilled, effects on building and occupants, and injured persons.
- Follow the direction of the wardens and emergency responders.

3.4.2 Chemical Alarms –N/A

3.5 Suspicious Packages

3.5.1 Possible Explosive Device – If a suspicious package is identified:

- Clear and isolate the immediate area.
- Call 911 and report all related information.
- Follow the direction of the wardens and emergency responders.

3.5.2 Possible Contaminated Letter or Package – If a suspicious package is identified that may be contaminated with a hazardous or biological material:

- Do not shake or further inspect the letter or package.
- Do not touch, taste or sniff the material.
- Do not move the letter or package around or show it to others.
- If you are holding the letter or package, carefully put it down on a stable surface.
- Leave the area and isolate the area by closing the door or notifying coworkers to stay clear.
- Wash hands with soap and water.
- Call 911 and report related information.
- Provide information to the responders including names of all persons in the area of or having contact with the letter or package.

3.6 Threat of an Explosive Device

3.6.1 If you receive a threat:

- Remain calm.
- Complete the Bomb Threat Instructions form at the back of the GSFC phone book.
- Report the threat to 911.

- Relay information to responders and be prepared to be interviewed.

3.6.2 If a threat has been received for your work area:
- Follow all instructions from wardens and responders.
- Relay all information about unusual activities, packages, or persons to the Wardens and Incident Commander.

3.7 Outdoor Atmospheric Hazard (e.g., Chemical Vapor Cloud)

3.7.1 Shelter-in-place – In certain cases, the best course of action to protect building occupants is to shelter-in-place. If this occurs, the Emergency Console will shut down building Heating, Ventilation and Air Conditioning (HVAV) systems. Building occupants should:
- Follow all instructions from Building Wardens and responders
- Stay indoors
- Stay away from exterior doors

3.7.2 Special Evacuation Routes – In certain cases, it may be necessary to evacuate personnel by a specific route to prevent exposure to hazards. Building occupants should:
- Follow all instructions of wardens and responders
- Use the routes designated by the wardens and responders.
- Assemble at the locations designated by the wardens and responders.

3.8 Weather-Related Emergencies

In a weather-related emergency, it may be necessary to either evacuate the building, or shelter-in-place until the emergency has passed. Building occupants should follow all instructions from wardens and responders.

3.9 Other Emergencies

For emergencies not specifically addressed here, building occupants should follow the direction of the wardens and responders.

3.10 Procedures for Persons with Disabilities
All disabled occupants of B4 are able to move on their own to designated evacuation routes.

4. Incident Management Responsibilities: ***Who will help me?***

4.1 Facilities Operations Manager (FOM)

The FOM or his/her alternate has the authority to stop work or to evacuate the building if they believe that a significant danger to personnel or property exists. The FOM (or alternate) serves as the Building Warden, and will appoint Floor Wardens and alternates for all areas.

4.2 Building Warden

The Building Warden is responsible for executing the Building [*insert building number*] Emergency Action Plan. One or more alternate Building Wardens shall be designated for when the FOM is absent from the facility. The Building Warden will be stationed at the Primary Assembly Area [*add further description if necessary*] and ensures that all Floor Wardens have completed their sweeps of assigned areas. An Evacuation Checklist provides an accurate total of personnel remaining in the building and status of warden check-ins. In the event of a fire or other hazardous event which makes the Primary Assembly Area unusable, the Building Warden will relocate to the Alternate Assembly Area as described in Attachment 1. The Building Warden serves as the only direct link to the onsite Incident Commander and provides status reports to the Incident Commander based on information received from the Floor Wardens during all evacuation operations.

4.3 Floor and Area Wardens

Floor Wardens and Area Wardens are normally assigned to designated parts of the building and are directly responsible for that area in the event of an emergency. Distinctive badges worn during evacuation operations identify the wardens. During an evacuation, the wardens are responsible for ensuring that all personnel in the area under their control are evacuated, including personnel who need assistance. Floor Wardens will report to the Building Warden when their respective areas are clear, addressing number of personnel remaining (see 3.2.4 and 3.2.5), rooms occupied, and any special circumstances. If Floor Wardens have any additional information with respect to the cause of the building evacuation, they should relay that information to the Building Warden as well. They then proceed to their respective assembly areas and assist with crowd control.

Floor Wardens or designated personnel may be required to perform a sweep of the building at the Building Warden's request. A two-person team is required for all 'sweep' operations and for the recovery of personnel awaiting assistance in designated Refuge Areas. Trained responders from the Incident Command Post (see 4.4) may carry out the above operations.

See Attachment [*use next available attachment number*] for Building Floor Warden assignments and responsibilities.

4.4 GSFC Security Office

The Security Office provides on-site Incident Commanders for all emergencies. A Security vehicle (identified by a green flashing light) becomes the NASA/GSFC Command Post for the incident, and the ranking on-scene Security Officer becomes the Incident Commander. The Incident Commander always stays at the Command Post vehicle during the emergency.

4.5 Facilities Management Division (FMD)

FMD provides service for sprinkler systems and the fire/smoke alarm systems, and controls HVAC systems. FMD also operates the Emergency Console. The Emergency Console receives all emergency calls and makes the proper notifications. The console is the central point for all GSFC radio communications. The Emergency Console remotely monitors all fire protection systems (fire detection and sprinklers systems) to initiate proper response to alarms and ensure they remain in service.

4.6 Prince George's County Fire Department (PGFD)

The PGFD provides services that are beyond the scope of GSFC capabilities. These services include fire suppression, rescue, emergency ambulance service, and hazardous material response. The GSFC Emergency Console is the sole GSFC interface for requesting these services.

4.7 Additional Support Organizations

The U.S. Park Police, the Maryland Department of Natural Resources, the Federal Protective Service, the Federal Aviation Administration, and the Federal Bureau of Investigation all provide emergency services in accordance with individual agency responsibility, authority and interagency agreements. Under certain conditions, any of the above could be asked to provide real-time assistance to the Goddard On-Scene Incident Commander.

5. Review and Validation

This document shall be reviewed and reissued annually according to configuration management procedures. If no changes are needed, it needs only a new approval signature and dates.

BUILDING WARDEN

EVACUATION CHECKLIST

Date of Evacuation:_____ Building Warden:_____

Start Time:_____ Evacuation Complete:_____hrs.

Type of Evacuation: ☐ Evacuation Drill ☐ Flooding

☐ Fire Evacuation ☐ Bomb Alert

☐ Smoke/Fumes ☐ Other

Floor Warden Check-in:	Evacuation Complete Yes/No	Personnel Remaining	Location
Ground Floor			
First Floor			
Second Floor			
Penthouse			
Sweep Team (as required)			
Total Personnel Remaining in Building ____:			

Remarks/Notes: _____

_____

_____

_____

_____

_____

Return completed form to GSFC Safety Coordinator, 301-286-5605

FLOOR WARDEN EVACUATION CHECKLIST

EMERGENCY EVACUATION

1. Ensure that all personnel evacuate your area of responsibility and leave the building.

2. Use stairwells, not building elevators.

3. Report to the Building Warden in the lobby and assist in crowd control

4. Assist personnel to an approved "Refuge Area" or out of the building to an evacuation assembly area.

REENTRY PROCEDURES

1. Reenter only when directed by the Building Warden.

2. Return to assigned work areas.

3. Survey the area to ensure nothing is missing.

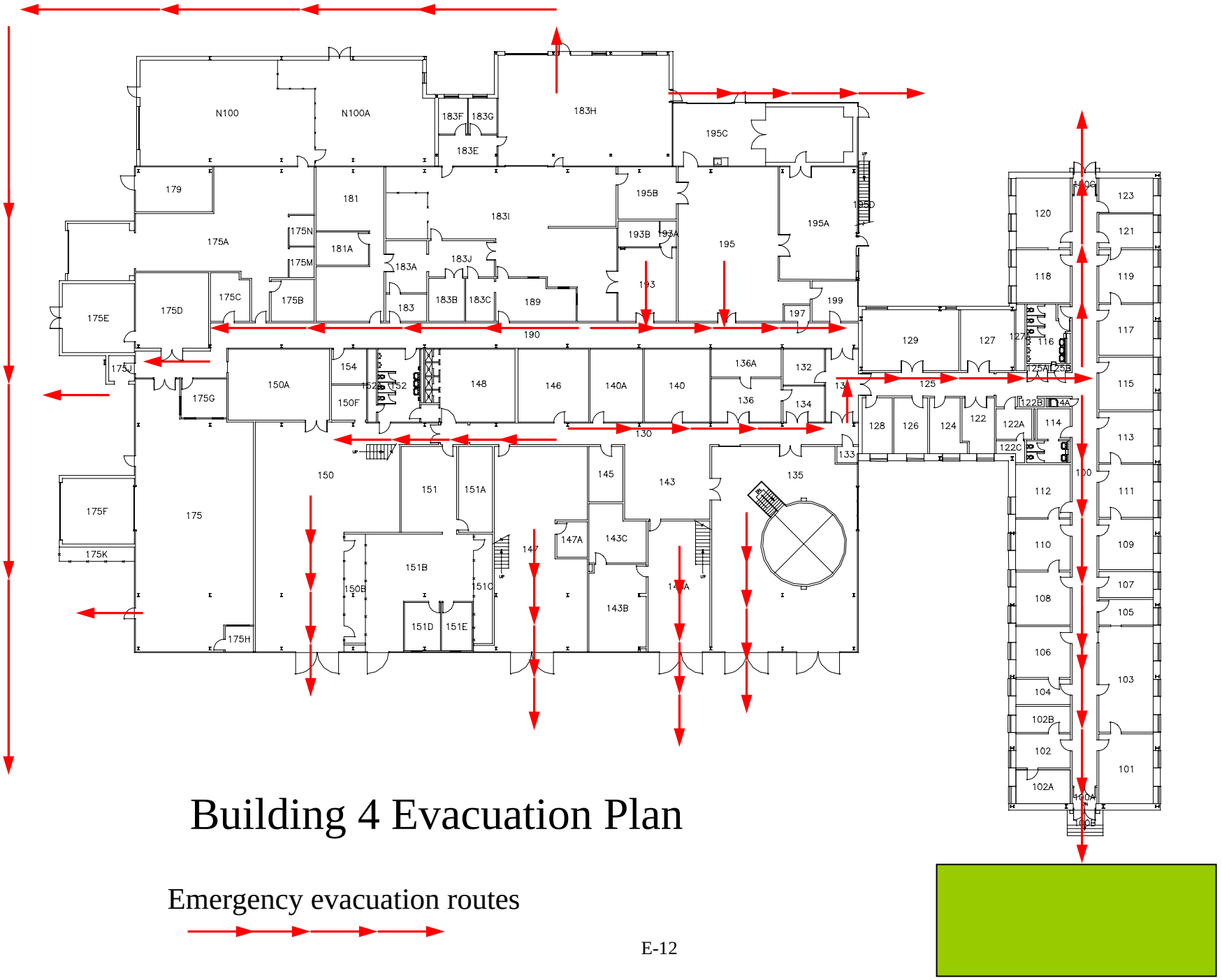
4. Reestablish normal interfaces.

CRITICAL OPERATIONS OR SPECIAL OPERATIONS

1. Perform an orderly "Pre-evacuation," i.e., a reduction of personnel in affected areas of the building.

2. Direction will be given by the Building Warden.

3. Assist personnel to an approved "Refuge Area" or out of the building to an evacuation assembly area.



Building 4 Evacuation Plan

Emergency evacuation routes

APPENDIX F

REFERENCES & RESOURCES
(web pages)

REFERENCE & RESOURCES

Safety, Health and Environmental Resources

WFF Safety Office
http://www.wff.nasa.gov/~code803/

WFF Safety Manual
http://www.wff.nasa.gov/~code803/pages/WSM2002.doc

GSFC FOM Manual
http://gsfc-artemis.gsfc.nasa.gov/220/FOMHB.htm

NASA Safety Initiative
http://www.hq.nasa.gov/office/codeq/safety/index.htm

GSFC and WFF Close Call/Mishap Reporting System
http://safety1st.gsfc.nasa.gov/closecall.shtml

NASA Headquarter Safety and Mission Assurance
http://www.hq.nasa.gov/office/codeq/doctree/index.htm

GSFC Directives Management System
http://gdms.gsfc.nasa.gov/gdms/plsql/menu_guest

NASA site for onsite learning and resources (SOLAR)
http://gdms.gsfc.nasa.gov/gdms/plsql/menu_guest

Occupational Safety and Health Administration (OSHA)General Industry (29 CFR 1910)
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1910

OSHA Standards for the Construction Industry (29 CFR 1926)
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926

OSHA Standards for Federal Employees (29 CFR 1960)
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1960

Material Safety Data Sheet (MSDS) Resources

- Wallops and Greenbelt http://msds.gsfc.nasa.gov/intro.html
- Vermont SIRI MSDS Archive http://hazard.com/msds2/
- Cornell University MSDS http://msds.pdc.cornell.edu/msdssrch.asp

NASA Online Directives NODIS
http://nodis.hq.nasa.gov/

GSFC Homepage Safety Link
http://safety1st.gsfc.nasa.gov

General GSFC Information – Websites, Newsgroups, and E-mail Addresses

NASA Headquarters
http://www.hq.nasa.gov/

NASA GSFC HR Office
http://ohr.gsfc.nasa.gov/

WFF Homepage
http://www.wff.nasa.gov/

NASA GSFC Homepage
http://www.gsfc.nasa.gov/

FMD Home Page (GSFC)
http://gsfc-aphrodite.gsfc.nasa.gov/220/home.htm

FMD Home Page (WFF)
http://www.wff.nasa.gov/~code228/

WFF Building Floor Plans
http://www.wff.nasa.gov/%7Ecode228/Code228restricted/locator/mb_locator.php

Americans with Disabilities
http://www.usdoj.gov/crt/ada/adahom1.htm

APPENDIX G

RESOURCE CONTACTS
(phone numbers)

WFF Safety Office
- Les McGonigal Office Chief 2518
- Robert Nock, Occupational Safety 2559
- Rob Beyma, Flight Safety 1756
- Tom Moskios, Ground Safety 2450

WFF Fire Department for Emergency ..... 911 or 1333
- Non-Emergency 1300

WFF Environmental Office 1311

Wayne Redmond, Lead FOM 1191

WICC HELP Desk ..... HELP or 4357

Judy Bruner, Safety Ombudsman 301 286-7679

WFF Health Unit 1766